3

TOOLS AND EQUIPMENT

Thorough knowledge of equipment is essential for success in the kitchen. Few food-service operations depend on nothing more than a range and an oven, an assortment of pots and pans, and knives and other hand tools. Modern technology continues to develop more and more specialized and technically advanced tools to reduce kitchen labor.

Much of this equipment is so complex or so sophisticated that only first-hand instruction and practice will teach you how to operate it effectively and safely. Other items, especially hand tools, are simple and need no explanation but require much practice to develop good manual skills.

A vast array of specialized equipment is available for today's kitchens. It would take a large book, not just a short chapter, to describe all of the many items you will encounter in your career—items such as pasta machines, crêpe machines, burger formers, breading machines, cookie droppers, beverage machines, Greek gyro broilers, doughnut glazers, conveyor fryers, and so on. In this technological age, nearly every year brings new tools to simplify various tasks.

AFTER READING THIS CHAPTER, YOU SHOULD BE ABLE TO

1. Identify the principal pieces of cooking equipment in food service, and indicate their uses.
2. Identify the principal pieces of processing, holding, and storage equipment in food service, and indicate their uses.
3. Identify the principal pots, pans, and containers in food service, and indicate their uses.
4. Identify the principal measuring devices, hand tools, and small equipment in food service, and indicate their uses.

COOKING EQUIPMENT

This chapter introduces you to the most commonly used equipment in food-service kitchens. It cannot, in this short space, serve as an operating manual for every model of every machine you will use. It also cannot take the place of demonstration by your instructor and of actual experience.

INTRODUCTION TO QUANTITY FOOD EQUIPMENT

Before we look at specific items, we must first consider points relating to the use of equipment in general.

Food Equipment Can Be Dangerous

Modern cooking and food processing equipment has an extraordinary capacity to burn, cut, smash, mangle, and amputate parts of the tender human body. This may sound like a harsh way to begin a chapter, but the intent is not to intimidate you or scare you but to inspire a healthy respect for the importance of proper safety and operating procedures.

Never use a piece of equipment until you are thoroughly familiar with its operation and all its features. You must also learn how to know when a machine is not operating correctly. When this happens, shut it down immediately and report the malfunction to a supervisor.

Not All Models Are Alike

Each manufacturer introduces slight variations on the basic equipment. While all convection ovens operate on the same basic principle, each model is slightly different, if only in the location of the switches. It is important to study the operating manual supplied with each item or to be taught by someone who already knows that item well and has operated it.

Cleaning Is Part of the Operating Procedure

Thorough, regular cleaning of all equipment is essential. Most large equipment can be partially disassembled for cleaning. Again, every model is slightly different. Operating manuals should describe these procedures in detail. If a manual is not available, you must get the information from someone who knows the equipment.

When purchasing equipment, look for models that have been tested and certified by recognized agencies that certify products and write standards for food, water, air, and consumer goods. Three prominent agencies are NSF International (formerly the National Sanitation Foundation), CSA International (formerly the Canadian Standards Association), and Underwriters Laboratory. These three agencies are recognized internationally. Products meeting their testing requirements are labeled or marked accordingly (Fig. 3.1). Criteria govern such factors as design and construction (for example, sealed joints and seams), materials used (for example, nontoxic materials, smooth and easily cleanable surfaces), and performance testing.

Conserve Energy

At one time, it was standard procedure for the chef to turn on the ovens and ranges first thing in the morning and keep them on all day. Today, high energy costs have made this practice expensive. Fortunately, modern equipment takes less time to heat.

Know the preheating time for all your cooking equipment so you don't need to turn it on before necessary. Plan production so equipment that requires a lot of energy is not on for long periods when not in use.

Your Hands are Your Best Tools

Machines are intended to be laborsaving devices. However, the usefulness of specialized processing equipment often depends on the volume of food it handles. It takes less time for a cook to slice a few pounds of onions by hand than to set up a slicing attachment, pass the onions through it, and break down and clean the equipment. This is why it is important to develop good manual skills.

FIGURE 3.1

(a) NSF International certification mark.
Courtesy of NSF International.

(b) The CSA International logo.
Courtesy of Canadian Standard Association International.

(c) The Underwriters Laboratories logo.
Reproduced with permission of Underwriters Laboratories, Inc.

RANGETOPS

The range is still the most important piece of cooking equipment in the kitchen, even though many of its functions have been taken over by other tools such as steamers, steam kettles, tilting skillets, and ovens.



Open-burner gas range with griddle
Courtesy of Vulcan Hart Company.

Types of Cooktops

1. **Open elements** (burners), either electric coils or gas flames. These tops are the fastest to heat and can be turned off after short use. However, cooktop space is limited to one pot per burner.
2. **Flattop** or **hot top** (lightweight). Burners covered with steel plate. More cook space is available. The top supports moderately heavy weights.
3. **Heavy-duty flattop.** Burners covered with heavy cast steel. The top supports many heavy pots. A thick top requires longer preheating. Set burners for different levels, and adjust cooking heat by moving pots to different spots on the top. A **ring-top range** is a type of flattop that has removable rings, allowing access to even more intense heat from the flames below.
4. **Induction cooktops.** The top of an induction unit does not become hot. Rather, it works by magnetically agitating the molecules in steel or iron cookware so the cookware becomes hot. As a result, much less energy is used and the kitchen stays cooler, because only the pots and pans and their contents become hot. There are no hot surfaces or open flames. Also, no warm-up is required. The top can be turned instantly on or off. Small, easily portable induction burners are available. These are useful for off-premise catering operations, for buffet service, and even for tableside heating and cooking. The disadvantage of this cooktop is that only iron or steel pots can be used. Traditional aluminum or copper cookware will not work. Some manufacturers of cookware have responded to the new demand by producing pots and pans made of aluminum sandwiched between layers of stainless steel. In this way, the good heat-conducting qualities of aluminum are preserved as well as adapted to this new technology.



Flattop range
Courtesy of Vulcan Hart Company.



Ring-top range
Courtesy of Manitowoc Foodservice.



Portable induction cooktop
Courtesy of Fagor America, Inc.

Dos and Don'ts

1. Make sure gas pilots are lit before turning on burners. If burners do not light, turn off gas and allow the gas to ventilate before trying again to light pilots or burners.
2. For maximum heat, adjust air intake so gas flames are blue with a white tip.
3. Do not keep flattop ranges on high heat unless items are being cooked over them. Damage to tops could result.

OVENS

The oven and the rangetop are the two workhorses of the traditional kitchen, which is why they are so often found in the same unit. Ovens are enclosed spaces in which food is heated, usually by hot air or, in some newer kinds of ovens, by microwaves or infrared radiation.

In addition to roasting and baking, ovens can do many of the jobs normally done on the rangetop. Many foods can be simmered, stewed, braised, or poached in the oven, freeing the rangetop and the chef's attention for other tasks.

There are many kinds of ovens beyond those discussed here, but they are often for specialty or high-volume uses. These include **conveyor ovens**, which carry foods through the oven on a steel conveyor belt; **holding ovens** or warmers, which are designed to hold many types of foods at serving temperatures for extended periods without drying out or overcooking (this category includes ovens that also cook the food, then automatically switch to holding temperature); and high-volume **roll-in ovens**, with large doors into which one can roll carts loaded with trays of food.



Stack or deck ovens
Courtesy of Blodgett Corporation.

CONVENTIONAL OVENS

Conventional ovens operate simply by heating air in an enclosed space. The most common ovens are part of the range unit, although separate oven units or ovens as part of a broiler unit are also available. **Stack ovens** are units that consist of individual shelves or decks arranged one above the other. Pans are placed directly on the oven deck rather than on wire shelves. Temperatures are adjustable for each deck.

Dos and Don'ts

Many of these points apply to other types of ovens as well.

1. Preheat ovens thoroughly, but no longer than necessary, to avoid excess energy use.
2. To avoid high energy loss and interruption of cooking, do not open the door more often than necessary.
3. Space items well to allow for heat circulation.
4. Be sure the pilot light is on before turning on gas ovens.



Convection oven
Courtesy of Vulcan Hart Company.

CONVECTION OVENS

Convection ovens contain fans that circulate the air and distribute the heat rapidly throughout the interior. Because of the forced air, foods cook more quickly at lower temperatures. Also, shelves can be placed closer together than in conventional ovens without blocking the heat flow.

Dos and Don'ts

1. For most products, set the temperature 25°–50°F (15°–30°C) lower than you would a conventional oven. Check the manufacturer's recommendations.
2. Watch cooking times closely. The forced heat cooks foods more quickly and tends to dry out some foods if they are overcooked. Roasts shrink more than they do in conventional ovens.
3. Many convection oven models should not be operated with the blower switch off, as the motor may burn out.
4. The forced air of a convection oven may deform soft items. Cake batters, for example, develop ripples. Check the manufacturer's recommendations.

Revolving Ovens

Revolving ovens, also called **reel ovens**, are large chambers containing many shelves or trays on an attachment like a Ferris wheel. This oven eliminates the problem of hot spots, or uneven baking, because the mechanism rotates the foods throughout the oven.

Revolving ovens are used in bakeshops and in high-volume operations.

Slow-Cook-and-Hold Ovens

The traditional oven is nothing more than a heated box equipped with a thermostat. Some modern ovens have more sophisticated features, such as computerized electronic controls and special probes that sense when a roast is done and tell the oven to switch from cooking temperature to holding temperature.

Many of these ovens are designed to be especially useful for low-temperature roasting (p. 421). The sensitive controls make it possible to cook at steady, reliable temperatures of 200°F (95°C) or lower and to hold foods at 140°F (60°C) for long periods. Large cuts of meat take many hours to roast at a low temperature like 200°F (95°C). By setting the controls in advance, the operator can even let meats roast overnight, unattended.

These ovens are available as convection ovens and as regular stationary-air ovens.

Combination Steamer Ovens

The **combination steamer oven**, also called a **combi oven**, can be operated in three modes: as a convection oven, as a convection steamer (p. 48), and, with both functions on at once, as a high-humidity oven. Injecting moisture into an oven while roasting meats can help reduce shrinkage and drying.

Modern combi ovens are equipped with computerized controls than enable them to be programmed for multiple changes of temperature and humidity during the cooking cycle, customizing the program for each product to be cooked. In addition, built-in temperature probes to be inserted in the product being cooked can be set to turn the oven off or change it to holding mode when the item reaches the desired internal temperature. Some special units are also equipped to inject smoke into the oven.

Because combi ovens have precise temperature control and can be set for very low cooking temperatures, they can also be used in some sous vide cooking (p. 121).



Combination steamer oven
Courtesy of Vulcan Hart Company.

Barbecue Ovens or Smoke Ovens

Barbecue ovens are like conventional ovens, but with one important difference: They produce wood smoke, which surrounds the food and adds flavor while it bakes or roasts. Special woods such as hickory, mesquite, or fruitwoods such as apple or cherry must be added to the smoke-producing part of the oven according to the manufacturer's instructions. This device is usually nothing more complicated than an electric heating element that heats small blocks or chips of the wood so they are hot enough to smoke but not hot enough to burst into flame.

Depending on the model, various cooking features are available. Thus, ovens may have smokeless roast/bake cycles, cold-smoke cycles (with the smoke element on but the oven off), holding cycles, and broiling capabilities.

A barbecue oven that uses wood smoke should not be confused with a ***smoker***, used for making hot-smoked and cold-smoked foods, as discussed in Chapter 28. The interior of a smoker is shown on page 851.



Smoke oven
Courtesy of Cookshack, Inc.

Infrared or Reconstituting Ovens

Infrared units contain quartz tubes or plates that generate intense infrared heat. These ovens are used primarily for reconstituting frozen foods. They bring large quantities of foods to serving temperature in a short time. The heat is even and controllable.

Wood-Burning Ovens

Ancient ovens were made of heavy masonry, brick, or clay and heated by building a wood fire inside them. In this type of oven, the brick absorbs the intense heat of the fire and cooks foods long after the fire has gone out and the ashes removed. Items such as breads and pizzas are baked directly on the floor of the oven, just as in modern deck ovens. Wood-burning ovens have once again come into fairly wide use, mostly in specialty restaurants that feature roasted meats, pizzas, and similar items. The foods absorb some of the appealing wood-smoke flavors and aromas.

Because a traditional wood-burning oven lacks a temperature control knob, some experience is needed to produce baked goods of consistent quality. During the firing of the oven, a wood fire is built directly on the hearth inside the oven. The flue and the door are kept open to allow the smoke to escape. After the fire is stopped, the ashes and embers are swept out. The door and flue are closed to allow the heat to equalize inside the dome of the oven. Initial temperatures inside the oven at this point may be as high as 900°F (480°C). Pizza can be baked at this temperature. For meats and breads, the oven is left to stand until the temperature gradually drops to the desired range. Alternatively, a fire can be kept going in the back of the oven while foods are roasted toward the front, with the flue kept open.



Modern wood-burning oven
Courtesy of Earthstone Ovens.



Microwave oven
Courtesy of Vulcan Hart Company.

Combination ovens, also available, are more controllable. These can be fired by gas alone, by wood alone, or by gas and wood together.

Microwave Ovens

In these ovens, special tubes generate microwave radiation, which creates heat inside the food. Microwave cooking is discussed in detail in Chapter 6.

BROILERS AND SALAMANDERS

Broilers are sometimes called **overhead broilers** to avoid confusing them with grills. Overhead broilers generate heat from above, and food items are placed on a grate beneath the heat source. Broiling is a favorite way of preparing steaks, chops, chicken, and many other items.

Heavy-duty broilers produce very high heat and consume vast quantities of energy. Some broilers are said to go as high as 2000°F (1100°C) at the burner.



Heavy-duty broiler
Courtesy of Vulcan Hart Company.



Salamander (above range)
Courtesy of Vulcan Hart Company.

Foods must be watched closely to avoid burning. Cooking temperature is adjusted by raising or lowering the grate that holds the food.

Salamanders are small broilers used primarily for browning or glazing the tops of some items. They may also be used for broiling small quantities during off-peak hours. Salamanders are usually mounted above the range, as illustrated in the photo. In addition, the photo of an open-burner gas range on page 43 shows a salamander under the griddle.



Gas grill
Courtesy of Vulcan Hart Company.

GRILLS

Grills are used for the same cooking operations as broilers, except the heat source is below the grid that holds the food rather than above it. Many people like grilled foods because of their charcoal taste, which is created by smoke from meat fats that drip into the heat source.

Although smoke from meat fats creates the taste people associate with grilled foods, actual wood-smoke flavors such as hickory or mesquite can be added to foods if those woods are burned in the grill under the food. In order to do this, you must use a grill designed to burn such fuels.

Types

Many grill models are in use. The major differences in operation among them are due to the difference in heat source—gas, electricity, or charcoal.

To operate, set areas of the grill to different temperatures and place foods in the areas with the appropriate cooking temperature. Keep grills clean, as the high temperatures can easily start grease fires.

GRIDDLES

Griddles are flat, smooth, heated surfaces on which food is cooked directly. Pancakes, French toast, hamburgers and other meats, eggs, and potato items are the foods most frequently cooked on a griddle. Griddles are available as separate units or as part of a rangetop (there is a griddle on the right side of the range pictured on page 43).

Clean griddle surfaces after every use so they will cook at peak efficiency. Polish with a griddle stone or griddle cloth until the surface shines. Follow the grain of the metal to avoid scratching.

Condition griddles after each cleaning or before each use to create a nonstick surface and to prevent rusting. Procedure: Spread a thin film of oil over the surface and heat to 400°F (200°C). Wipe clean and repeat until griddle has a smooth, nonstick finish.

ROTISSERIES

Rotisserie broilers cook meats and other foods by turning them slowly in front of electric- or gas-powered heating elements. Even though classical cooking theory categorizes spit-cooking as roasting, these cookers are more closely related to broilers in that the foods are cooked by the infrared heat of the elements.

Although they are especially suitable for chicken and other poultry, rotisseries can be used to cook any meat or other food that can be held on a spit or in any of various attachments or accessories.

Both enclosed (ovenlike) rotisseries and open or unclosed units are available. Small units hold about 8 chickens, and sizes range all the way to very large models that can hold as many as 70 chickens.

Because the heating elements are on the side (or sometimes above), the fats and juices don't drip into the flames as they do with grills. Drip pans catch juices, which can be used for basting or gravy making.

DEEP FRYERS

A deep fryer has only one use: to cook foods in hot fat. Yet because of the popularity of fried foods, this function is an important one.

Standard deep fryers are powered by either gas or electricity and have thermostatic controls that maintain fat at preset temperatures.

Automatic fryers remove food from the fat automatically after a preset time.

Pressure fryers are covered fry kettles that fry foods under pressure. Foods cook faster, even at a lower fat temperature.

Dos and Don'ts

Frying procedures and the care of frying fat are discussed in detail in Chapter 12. The following points relate to the operation of the equipment:

1. When filling kettles with solid fats, set the thermostat at 250°F (120°C) until the fat has melted enough to cover the heating elements.
2. Keep the kettles filled to the fill line.
3. Make sure the drain valve is shut before adding fat to the empty kettle.
4. Check the accuracy of the thermostat regularly by reading the fat temperature with a thermometer.

Cleaning

Cleaning procedures differ greatly depending on the model. Here is a general procedure:

1. Shut off the power.
2. Drain the fat through a filter into a dry container (unless you are discarding it). Before you start, be sure the container is large enough to hold all the fat.



Deep fryers
Courtesy of Vulcan Hart Company.

3. Flush food particles from the sides and bottom of the kettle with some of the hot fat.
4. Wash the kettle with a mild detergent solution. If the kettle is not removable, turn on the fryer and bring the detergent solution almost to a boil (beware of foaming over). Scrub with a stiff brush.
5. Drain and rinse thoroughly with clean water.
6. Dry the kettle, heating elements, and baskets thoroughly.
7. Refill with strained or fresh fat. (If the fat is drained by a spigot or valve, be sure it is closed before you refill the fryer.)



Tilting skillet
Courtesy of Vulcan Hart Company.

TILTING SKILLETS

The tilting skillet, also known as the **tilting brazier** or **tilting fry pan**, is a versatile and efficient piece of equipment. It can be used as a griddle, fry pan, brazier, stewpot, stockpot, steamer, and bain-marie or steam table.

The tilting skillet is a large, shallow, flat-bottomed pot. To look at it another way, it is a griddle with sides 6 inches (24 cm) high, plus a cover. It has a tilting mechanism that enables liquids to be poured out of it. Power may be gas or electric.

Clean the skillet immediately after each use, before food has time to dry on. Add water, turn on the skillet to heat it, and scrub thoroughly.

STEAM-JACKETED KETTLES

Steam-jacketed kettles, or **steam kettles**, are sometimes thought of as stockpots heated not just on the bottom but on the sides as well. This comparison is only partly accurate. Steam kettles heat much more quickly and have more uniform and controllable heat than pots on the range.



Small tilt (trunnion) kettle
Courtesy of Vulcan Hart Company.



Large floor-model steam kettle
Courtesy of Vulcan Hart Company.

Types

Steam kettles range in capacity from 2 gallons (7.5 L) to over 100 gallons (378.5 L). Some large institutional kettles hold 4,000 gallons (15,142 L). **Tilt** or **trunnion kettles** can be tilted for emptying, either by turning a wheel or by pulling a lever. **Nontilt kettles** are emptied by a spigot and drain on the bottom. Heat is controlled by regulating the steam flow or by adjusting the thermostat. Steam may be from an outside source or self-generated. ***Exercise caution when operating all steam equipment. Steam can cause serious burns***.

Clean immediately after use to avoid food drying on surfaces. Disassemble the spigot and drain, and clean with a bottle brush.

STEAM COOKERS

Steam cookers are ideal for cooking vegetables and many other foods rapidly and with minimum loss of nutrients and flavor. For this reason, they are becoming more common in both large and small kitchens.

Types

Pressure steamers cook foods under a pressure of 15 pounds per square inch (1.05 kg/cm) in high-pressure steamers or 4–6 pounds per square inch (0.28–0.42 kg/cm) in low-pressure steamers. They are operated by a timer, which shuts the equipment off after a preset time. The door cannot be opened until the pressure returns to zero.

Pressureless or **convection steamers** do not operate under pressure. Jets of steam are directed at the food to speed the heat transfer, just as the fan in a convection oven speeds cooking. The door can be opened any time during cooking.

All steamers hold standard-size counter pans (12 × 20 inches or 325 × 530 mm) or fractions thereof. Their capacity varies from one to many pans.

Steamer operation varies greatly, depending on the model. Check the operating manual and be sure you understand a particular model well before attempting to operate it.

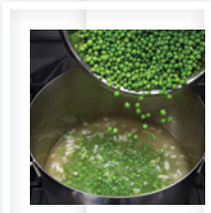
Caution is important with all steam equipment because of the danger of severe burns.



Convection steamer
Courtesy of Vulcan Hart Company.



Pressure steamer
Courtesy of Vulcan Hart Company.



KEY POINTS TO REVIEW

- What are the four basic types of cooktops?
- What is the difference between a standard oven and a convection oven? List four guidelines for operating each type.
- What is the difference between a broiler, a salamander, a grill, and a griddle?
- What are four guidelines for operating a standard deep fryer? Describe the general procedure for cleaning a deep fryer.

PROCESSING, HOLDING, AND STORAGE EQUIPMENT

MIXERS

Vertical mixers are important and versatile tools for many kinds of food mixing and processing jobs, both in the bakeshop and in the kitchen. (The kind of mixer shown here is called the ***planetary mixer***, because the beater attachment revolves on its own axis as it also rotates around the bowl, like the motion of planets around the sun. The baking industry also uses a number of specialized mixers not discussed here.)

Types

Bench-model mixers range in capacity from 5 to 20 quarts (5 to 20 L). Floor models are available as large as 140 quarts (133 L). Adaptor rings enable several bowl sizes to be used on one machine. Most mixers have three operating speeds.



Small table-model mixer
Courtesy of Hobart Corporation.



Large floor-model mixer
Courtesy of Hobart Corporation.

Agitator Attachments

There are three main mixing attachments, plus some specialized ones. The **paddle** is a flat blade used for general mixing. The **wire whip** is used for such tasks as beating cream and eggs and making mayonnaise. The **dough arm** or **hook** is used for mixing and kneading yeast doughs.



Mixer attachments: (left) paddle, (center) whip, (right) dough arm
Courtesy of Hobart Corporation.

Dos and Don'ts

1. Make sure the bowl and the mixing attachment are firmly in place before turning on the machine.
2. Make sure you are using the right size attachment for the bowl. Using a 40-quart paddle with a 30-quart bowl, for example, could cause serious damage. Sizes in quarts are marked on the sides of large bowls and on the tops of attachments.
3. Turn off the machine before scraping down the bowl or inserting a spoon, scraper, or hand into the bowl. Mixer motors are powerful and can cause serious injury.
4. Turn off the machine before changing speeds.



Rotation chopper
Courtesy of Hobart Corporation.

FOOD CUTTERS

The food cutter or rotation chopper, familiarly known as the **buffalo chopper**, is a common piece of equipment used for general food chopping. A variety of attachments (described in the next section) makes it a versatile tool.

General Operation

Food is placed in a rotating bowl, which carries the food to a pair of knives spinning rapidly under a cover. The fineness of the cut depends on how long the food is left in the machine.

Dos and Don'ts

1. Always make sure the machine is completely assembled before use.
2. Close the cover lock knob, or the machine will not turn on.
3. Never reach under the bowl cover while the machine is running.
4. For uniform chopping, place the food in the bowl all at one time.
5. Keep the knives sharp. Dull knives bruise food rather than cut it cleanly.



Grinder attachment (on separate motor)
Courtesy of Hobart Corporation.

Attachments for Mixers and Food Choppers

The following are the most common of the many attachments designed to fit both the food chopper and the vertical mixer:

1. The **food grinder** is used mostly for grinding meats, although other moist foods may be ground also. Food is forced through a feed tube into a screw, which pushes the food through holes in a plate, at which point it is cut by a rotating blade. The size of the holes regulates the fineness of the grind.

Make sure the rotating blade is attached properly, cutting edge out, when assembling the grinder.

2. The **slicer/shredder** consists of a hopper and a lever that feeds the food onto a rotating disk or plate. The plate cuts or shreds the food and drops it into a receiving container. The slicing plate may be adjusted to cut various thicknesses.
3. The **dicer** attachment forces foods through a grid-type blade that cuts them into perfect dice. Blades of different sizes may be used.



Slicer/shredder attachment
Courtesy of Hobart Corporation.

SLICERS

The **slicer** is a valuable machine because it slices foods more evenly and uniformly than can be done by hand. This makes it valuable for portion control and for reducing cutting loss.

Types

Most modern slicers have blades set at an angle. Slices fall away from these blades with less breaking and folding than from vertical blades.

With manual machines, the operator must move the carriage back and forth to slice the food. Automatic machines move the carriage with an electric motor.



Slicer
Courtesy of Hobart Corporation.

Dos and Don'ts

1. Be sure the machine is properly assembled before using.
2. Always use the end weight to press the food against the blade. This protects the hand from serious cuts and provides a more even pressure on the food, resulting in more uniform slices.
3. Set the thickness control knob to zero when the machine is not in use or is being cleaned.
4. Always unplug the machine before dismantling and cleaning.
5. Keep the blade sharp with the sharpening stones provided with the slicer.

VERTICAL CUTTER/MIXERS

The vertical cutter/mixer (VCM) is like a large, powerful, high-speed blender. It is used to chop and mix large quantities of foods rapidly. It can also be used for puréeing (soups, for example) and for mixing liquids.

Types

VCMs range in size from 15 to 80 quarts (14 to 75 liters). The small models have a hand-operated mixing baffle, which moves the foods into the blades. Larger machines have automatic baffles.

Dos and Don'ts

1. Watch processing times closely. Chopping times are so short that an extra second can make cabbage soup out of coleslaw.
2. Make sure the machine is properly assembled before use.
3. After turning off the machine, allow the blades to come to a full stop before opening the cover.
4. Keep the blades sharp. Dull blades bruise food.

FOOD PROCESSORS

Food processors were used in commercial kitchens long before home models were introduced. Professional models are two to four times larger than the largest home models. They consist of a motor in a heavy base topped by a cylindrical work bowl containing an



Food processor
Courtesy of Robot Coupe USA.

S-shaped blade. Processors are used to chop or purée foods, including raw or cooked meats, and to mix or emulsify such items as sauces and flavored butters. With special disk attachments in place of the standard blade, they can also slice, shred, and julienne solid foods such as vegetables.

In basic design, a food processor is similar to a vertical cutter/mixer. The same dos and don'ts should be observed.

BLENDERS

Like the VCM and the food processor, a blender consists of a motor in a base, topped by a container with a spinning blade. However, because the blender's container is tall and narrow, it is more suited for mixing and puréeing liquids than for chopping solid foods. In the commercial kitchen, the blender is used to mix, purée, and emulsify liquids such as soups, sauces, and batters. It is also used in bars and coffeehouses to prepare certain drinks.

Blender motors may have from 2 to 10 speeds, or even more. The containers are made of stainless steel, glass, or plastic. The blade assembly at the base of the container can be disassembled for thorough cleaning.



Professional blender
Courtesy of Waring Products.

IMMERSION BLENDERS

An immersion blender, also called a **stick blender** or **burr mixer**, consists of the blade of a blender, protected by a guard, at the bottom end of a long wand or shaft with a motor at the top. Using an immersion blender, the cook can purée or mix hot or cold foods in any container without transferring them to a blender jar. This makes it possible to blend hot foods in their cooking pots. The largest stick blenders are long enough to purée foods in large steam kettles.

SOUS VIDE EQUIPMENT

Two types of equipment are essential for operations that use sous vide (pp. 7 and 121) cooking techniques: vacuum-packaging equipment and cooking equipment.

The most commonly used packaging equipment in food service is a *chamber vacuum packer*. Food is placed in a specially designed plastic bag and inserted in the chamber. The chamber is then closed and the machine pulls the air from the bag and seals the bag. Vacuum pressure may be varied from low, for delicate, easily crushed foods, to high, for firmer foods.

Precise control of cooking temperature is at the heart of sous vide cooking, and for this, *immersion circulators* are used to heat the water in a hot-water bath. Immersion circulators have a heating element, a pump that constantly circulates the water, and a temperature control that can keep the water at a steady temperature to within a fraction of a degree.

Combi ovens (p. 45), with their precise temperature control and low-heat cooking capabilities, are also used for sous vide cooking.

Rapid cooling is also important in sous vide cooking. Larger operations may want to invest in a blast cooler. For smaller kitchens, a regular ice bath may be sufficient.



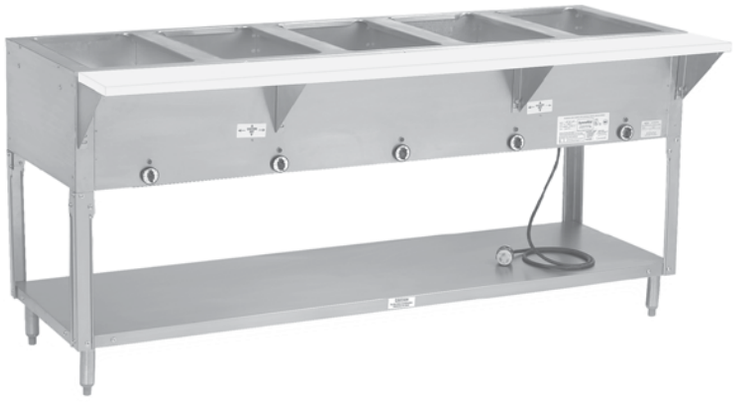
Chamber vacuum packer
Courtesy of PolyScience.



Immersion circulator
Courtesy of PolyScience.

HOT FOOD HOLDING EQUIPMENT

Several types of equipment are used to keep food hot for service. This equipment is designed to hold foods above 135°F (57°C) in order to prevent the growth of bacteria that can cause disease. Because food continues to cook at these temperatures, it should be held for as short a time as possible.



Steam table
Courtesy of Hobart Corporation.

1. **Steam tables** are standard holding equipment for serving lines. Standard-size counter pans or hotel pans are used as inserts to hold the foods. Flat or domed covers may be used to cover the foods.

   Check water levels in steam tables periodically to make sure they don't go dry. Electrically heated counters that operate dry—without steam—are also available.

2. A **bain-marie** is a hot-water bath. Containers of foods are set on a rack in a shallow container of water, which is heated by electricity, gas, or steam. The bain-marie is used more in the production area, while the steam table is used in the service area.

3. **Overhead infrared lamps** are used in service areas to keep plated food warm before it is picked up by the service staff. They are also used for keeping large roasts warm.

   Foods dry out quickly under holding lamps. This is a disadvantage for almost all foods except French fries and other deep-fried foods, which lose their crispness if they are kept moist.

COLD FOOD STORAGE EQUIPMENT

The quality of the food you serve depends to a great degree on refrigeration equipment. By keeping foods cold, usually below 41°F (5°C), the refrigerator (known in the trade as the ***cooler*** or the ***box***) guards against spoilage and bacterial growth.

Several types of refrigerator are used in food service. The **walk-in** is a room-size refrigerator with built-in shelves on the walls. Walk-ins can be customized to fit nearly any available space.

The **reach-in** is a standard upright refrigerator similar in shape to a large home refrigerator, but without the freezer unit. It may have shelves or simply brackets for holding sheet pans.

Small reach-ins that fit under counters, as well as refrigerated drawers, are used in prep and service areas of the kitchen. Finally, refrigerated display cases are used in retail and the dining areas of delis, bakeries, diners, coffee shops, and some restaurants.

Freezers are used to hold foods for longer times, or to store foods purchased in frozen form. Like refrigerators, freezers are available as walk-ins, reach-ins, and smaller units.

To enable refrigerators and freezers to work at top efficiency, observe the following rules:

1. Place items far enough apart and away from the inside walls of refrigerators so cold air can circulate. Freezers, however, work most efficiently when they are full.
2. Keep the door closed as much as possible. When storing or removing an item, do it quickly and shut the door.
3. Keep stored foods well wrapped or covered to prevent drying and transfer of odors. Meats are an exception to this rule (p. 483).
4. Keep refrigerators spotlessly clean.



KEY POINTS TO REVIEW

- What are four guidelines for the safe operation of a vertical mixer? What three types of beater attachment are used most often on a mixer, and what are they used for?
- What are five guidelines for the correct operation of a rotation chopper (buffalo chopper)?
- What are five guidelines for the safe operation of a slicing machine?
- What are five kinds of equipment used to keep foods out of the Food Danger Zone?

POTS, PANS, AND CONTAINERS

METALS AND CONDUCTIVITY

A good cooking utensil distributes heat evenly and uniformly. A poor cooking utensil develops hot spots that are likely to burn or scorch the food being cooked. Two factors affect a pan's ability to cook evenly:

1. ***Thickness of the metal.*** A heavy-gauge pot cooks more evenly than one made of thin metal. Thickness is most important on the bottom.
2. ***Kind of metal.*** Different metals have different conductivity, or the speed at which they transfer or disperse heat. The following materials are used for cooking equipment:

- ***Aluminum*** is used for most cooking utensils in food-service kitchens. It is a good conductor, and its light weight makes pots and pans easy to handle. Because it is a relatively soft metal, it should not be banged around or abused.

  Do not use aluminum for storage or for long cooking of strong acids because it reacts chemically with many foods. Also, it tends to discolor light-colored foods such as sauces, especially if they are stirred or beaten with a metal spoon or whip.

  Pans made of ***anodized aluminum***, sold under such brand names as Calphalon, have surfaces that are harder and more corrosion-resistant than regular aluminum pans. Although this is not, strictly speaking, a nonstick finish, it is less porous than untreated aluminum, so foods are less likely to stick. Also, it is more resistant to acids than regular aluminum, and it will not discolor light-colored foods. Its disadvantages are that it is more expensive than and not quite as durable as standard aluminum.

  Aluminum, of course, cannot be used on induction cooktops, which work only with steel or iron (p. 43).

- ***Copper***, the best heat conductor of all, was once widely used for cooking utensils. However, it is extremely expensive and requires a great deal of care. In addition, it is heavy. Today it is used mostly for show, although a few high-end restaurants use it for cooking as well.

  Copper reacts chemically with many foods to create poisonous compounds, so copper pans must be lined with another metal, such as tin or stainless steel.

- ***Stainless steel*** is a poor heat conductor. Cooking pots and pans made of it tend to scorch foods easily because the heat does not disperse throughout the pan quickly and evenly. Stainless steel is ideal for storage containers because it does not react with foods as aluminum does. It is also used for low-temperature cooking or holding equipment, such as steamer pans and counter pans, where scorching or hot spots are not a problem.

  Stainless-steel pots and pans are available with a heavy layer of copper or aluminum bonded to the bottom. Heavy aluminum pans may also be lined with stainless steel on the inside, or on both the inside and outside. This feature gives the advantages of stainless steel (hardness, durability, nonreactivity with acid foods, and nondiscoloration of light sauces) with the heat-conducting qualities of copper or aluminum. These pans are usually expensive.

- ***Cast iron*** is a favorite material with many chefs because of its ability to distribute heat evenly and to maintain high temperatures for long periods. It is used in griddles and heavy skillets. Cast iron cracks easily if dropped. It rusts quickly unless kept properly conditioned (p. 783) and dry.

- ***Porcelain enamel-lined pans*** should not be used. In fact, they are forbidden by some health departments. They scratch and chip easily, providing good hiding places for bacteria. Also, certain kinds of gray enamel can cause food poisoning if chipped.

- ***Nonstick plastic-type coatings***, known by brand names including Teflon and Silverstone, provide a slippery finish, but one that requires a lot of care because it is easily scratched. Do not use metal spoons or spatulas with this equipment. Instead, use tools made of plastic, silicone, or wood. Do not use abrasive materials to clean the nonstick surface.

Nonstick pans are best reserved for eggs and other items that are likely to be damaged if they stick. Many chefs keep a set of nonstick egg pans and use them for no other purpose. In addition, these pans are useful for dietary cooking because they enable cooks to sauté foods with little or no added fat.

Nonstick coatings should not be used for sautéing and braising procedures that involve deglazing to make a sauce (p. 183). Foods do not brown as well in nonstick pans as in traditional metal pans, and they do not form a fond (the flavorful browned bits that stick to the pan) that can be deglazed to make a sauce or braising liquid.

- ***Glass*** and ***earthenware*** have limited use in commercial kitchens because they break easily. They are poor conductors of heat but are resistant to corrosion and food acids.

POTS AND PANS AND THEIR USES

1. **Stockpot.**
   A large, deep, straight-sided pot for preparing stocks and simmering large quantities of liquids. Stockpots with spigots allow liquid to be drained off without disturbing the solid contents or lifting the pot. Sizes: 8–200 quarts (liters).

2. **Saucepot.**
   A round pot of medium depth. Similar to a stockpot but shallower, making stirring or mixing easier. Used for soups, sauces, and other liquids. Sizes: 6–60 quarts (liters).

3. **Brazier.**
   A round, broad, shallow, heavy-duty pot with straight sides. Also called a ***rondeau***. Used for browning, braising, and stewing meats. Sizes: 11–30 quarts (liters).

4. **Saucepan.**
   Similar to a small, shallow, light saucepot, but with one long handle instead of two loop handles. May have straight or slanted sides. Used for general rangetop cooking. Sizes: 1½–15 quarts (liters).

5. **Sauté pan, straight-sided.**
   Also called a ***sautoir***. Similar to a shallow, straight-sided saucepan, but heavier. Used for browning, sautéing, and frying. Because of its broad surface area, the sauté pan is used for cooking sauces and other liquids when rapid reduction is required. Sizes: 2½–5 inches (65–130 mm) deep; 6–16 inches (160–400 mm) in diameter.

6. **Sauté pan, slope-sided.**
   Also called a ***sauteuse***. Used for general sautéing and frying of meats, fish, vegetables, and eggs. The sloping sides allow the cook to flip and toss items without using a spatula, and they make it easier to get at the food when a spatula is used. Sizes: 6–14 inches (160–360 mm) top diameter.

7. **Cast-iron skillet.**
   Very heavy, thick-bottomed fry pan. Used for pan-frying when steady, even heat is desired.

8. **Double boiler.**
   A pot with two sections. The lower section, similar to a stockpot, holds boiling water. The upper section holds foods that must be cooked at low temperatures and cannot be cooked over direct heat. Size of top section: 4–36 quarts (liters).


Stockpot


Stockpot with spigot


Saucepot


Brazier


Saucepan


Straight-sided sauté pan


Slope-sided sauté pan


Cast-iron skillet


Double boiler



Sheet pan



Fish poacher
Courtesy of RSVP International, Inc.



Wok



Hotel pan

9. **Sheet pan or bun pan.**
   A shallow, rectangular pan (1 inch/25 mm deep) for baking cakes, rolls, and cookies, and for baking or broiling certain meats and fish. Sizes: full pan, 18 × 26 inches (46 × 66 cm); half-pan, 18 × 13 inches (46 × 33 cm).



Bake pan

10. **Bake pan.**
    A rectangular pan about 2 inches (50 mm) deep. Used for general baking. Available in a variety of sizes.



Roasting pan

11. **Roasting pan.**
    A large rectangular pan, deeper and heavier than a bake pan. Used for roasting meats and poultry.

12. **Fish poacher.**
    A long, narrow, straight-sided pan with a removable rack insert. Used for poaching whole fish.

13. **Wok.**
    A round-bottomed steel pan with two loop handles. Used for stir-frying, especially in Chinese cuisine. Woks are best used with special burner units that have a high heat output and a broad ring-shaped support that holds the wok steady during cooking.

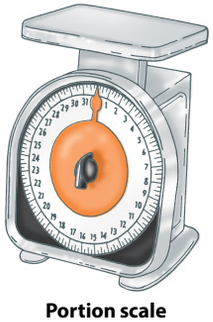
14. **Hotel pan, also called counter pan, steam table pan, or service pan.**
    A rectangular pan, usually made of stainless steel. Designed to hold foods in service counters. Also used for baking, steaming, and subsequent serving. Also used for storage. Standard size: 12 × 20 inches. Fractions of this size (½, ⅓, etc.) are also available. Standard depth: 2½ inches (65 mm). Deeper sizes are also available. (Standard metric pan is 325 × 530 mm.)



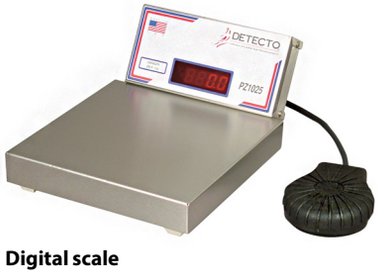
Bain-marie inserts

15. **Bain-marie insert, usually called simply bain-marie.**
    A tall, cylindrical stainless-steel container. Used for storage and for holding foods in a bain-marie (water bath). Sizes: 1–36 quarts (liters).

16. **Stainless-steel bowl.**
    A round-bottomed bowl. Used for mixing, whipping, and producing hollandaise, mayonnaise, whipped cream, and egg white foams. Round construction enables whip to reach all areas. Available in many sizes.



Portion scale



Digital scale
Courtesy of Cardinal Detecto

MEASURING DEVICES, HAND TOOLS, AND SMALL EQUIPMENT

MEASURING DEVICES

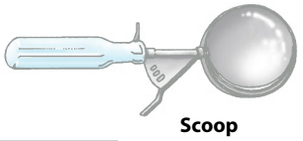
The following equipment is discussed in terms of U.S. measurements. Comparable items in metric units are also available.

1. **Scales.** Most recipe ingredients are measured by weight, so accurate scales are important. **Portion scales** are used for measuring ingredients as well as for portioning products for service. Traditional portion scales are spring-operated and usually have a dial to indicate weight. More accurate **digital scales** are electrically operated and provide a digital readout. The **baker's balance scale** is discussed in Chapter 31.
2. **Volume measures** used for liquids have lips for easy pouring. Sizes are pints, quarts, half-gallons, and gallons. Each size is marked off into fourths by ridges on the sides.
3. **Measuring cups** are available in 1-, ½-, ⅓-, and ¼-cup sizes. They can be used for both liquid and dry measures.
4. **Measuring spoons** are used for measuring very small volumes: 1 tablespoon, 1 teaspoon, ½ teaspoon, and ¼ teaspoon. They are used most often for spices and seasonings.



Liquid volume measure

5. **Ladles** are used for measuring and portioning liquids. The size, in ounces, is stamped on the handle.
6. **Scoops** come in standard sizes and have a lever for mechanical release. They are used for portioning soft solid foods. Scoop sizes are listed in Table 3.1. The number of the scoop indicates the number of level scoopfuls per quart. In actual use, a rounded scoopful is often more practical than a level scoopful, so exact weights will vary.



Scoop



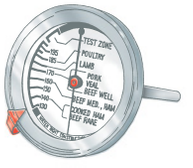
Ladles

TABLE 3.1 Scoop Sizes

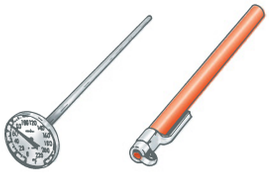
	U.S. Measure		Metric Measure	
Scoop Number	Volume	Approximate Weight	Volume	Approximate Weight
6	⅔ cup	5 oz	160 mL	140 g
8	½ cup	4 oz	120 mL	110 g
10	3 fl oz	3–3½ oz	90 mL	85–100 g
12	⅓ cup	2½–3 oz	80 mL	70–85 g
16	¼ cup	2–2½ oz	60 mL	60–70 g
20	1½ fl oz	1¾ oz	45 mL	50 g
24	1⅓ fl oz	1⅓ oz	40 mL	40 g
30	1 fl oz	1 oz	30 mL	30 g
40	0.8 fl oz	0.8 oz	24 mL	23 g
60	½ fl oz	½ oz	15 mL	15 g

Note: Weights vary greatly with different foods, depending on how compact they are. Best practice is to weigh a scoopful of an item before proceeding with portioning.

7. **Thermometers** measure temperature. There are many kinds for many purposes.
   - A **meat thermometer** indicates internal temperature of meats. It is inserted before cooking and left in the product during cooking.
   - An **instant-read thermometer** gives readings within a few seconds of being inserted in a food product. It reads from 0°F to 220°F. Many chefs carry these in their jacket pocket like a pen, ready whenever needed. Instant-read thermometers must not be left in meats during roasting, or they will be damaged.
   - **Fat thermometers** and **candy thermometers** test temperatures of frying fats and sugar syrups. They read up to 400°F.
   - Special thermometers are used to test the accuracy of oven, refrigerator, and freezer thermostats.



Meat thermometer



Instant-read thermometer with holder

KNIVES

Knife Materials

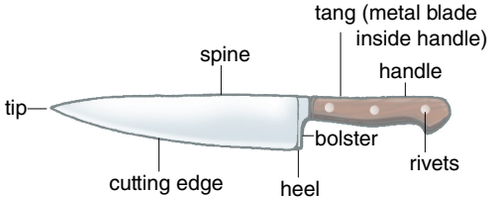
The metal a knife blade is made of is an important consideration, as the metal must be able to take and hold a very fine edge:

1. **Carbon steel** was for many years the traditional favorite because it can be honed to an extremely sharp edge. Its disadvantages are that it corrodes and discolors easily, especially when used with acid foods and onions. Also, it discolors some foods (such as hard-cooked eggs) and may leave a metallic taste. Because of these disadvantages, it has given way to high-carbon stainless steel (described below), which is now the preferred material for the best knives.

2. **Traditional stainless-steel alloys** will not rust or corrode, but they are much harder to sharpen than carbon steel. Stainless steel is used mostly for low-cost, lightweight knives.
3. **High-carbon stainless steel** is a relatively new alloy that combines the best aspects of carbon steel and stainless steel. It takes an edge almost as well as carbon steel, and it will not rust, corrode, or discolor. Knives made of this material are highly prized and relatively expensive. Most high-quality knives today are made of high-carbon stainless steel.

Knife Parts

Chef's knives and other knives have a number of parts, and you should be familiar with their names. These parts are illustrated in the diagram.



The parts of a chef's knife

The **spine** is the back of the blade. It is the edge opposite the **cutting edge**. The tip is the pointed end of the blade, while the **heel** is the back end of the blade closest to the handle. On some knives, the blade has a raised part called a bolster at the heel end. The bolster is a sort of guard that helps protect the hand from slips and also helps balance the weight of the knife.

The **tang** is the portion of the metal blade inside the handle. The highest-quality, most durable knives have a **full tang**, which means the tang runs the full length of the handle. On knives with traditional wood handles, **rivets** hold the **handle** to the tang. The rivets should be perfectly smooth and flush with the handle. Composite molded handles are bonded to the tang without rivets.

Knives and Their Uses



French knife or chef's knife

1. **French knife or chef's knife.**
   Most frequently used knife in the kitchen, for general-purpose chopping, slicing, dicing, and so on. The blade is wide at the heel and tapers to a point. Blade length of 10 inches (260 mm) is most popular for general work. Larger knives are for heavy cutting and chopping. Smaller blades are for more delicate work.

   This is your most important tool, so you must learn to handle it and care for it well. Chapter 7 explains its use in detail.



Santoku knife or Japanese cook's knife

2. **Santoku knife or Japanese cook's knife.**
   A wide-bladed knife that is often used as a substitute for the traditional chef's knife. Blades are usually 5 inches (13 cm) or 7 inches (18 cm) long.



Utility knife

3. **Utility knife or salad knife.**
   A narrow, pointed knife 6–8 inches (160–200 mm) long. Used mostly for pantry work, cutting and preparing lettuce, fruits, and so on. Also useful for carving roast chicken and duck.



Paring knife

4. **Paring knife.**
   A small, pointed blade 2–4 inches (50–100 mm) long. Used for trimming and paring vegetables and fruits.



Boning knife

5. **Boning knife.**
   A thin, pointed blade about 6 inches (160 mm) long. Used for boning raw meats and poultry. Stiff blades are used for heavier work. Flexible blades are used for lighter work and for filleting fish.



Slicer

6. **Slicer.**
   A long, slender, flexible blade up to 14 inches (360 mm) long. Used for carving and slicing cooked meats.

7. **Serrated slicer.**
   Like a slicer, but with a serrated edge. Used for cutting breads, cakes, and similar items.


Serrated slicer

8. **Butcher knife.**
   A heavy, broad, slightly curved blade. Used for cutting, sectioning, and trimming raw meats in the butcher shop.


Butcher knife

9. **Scimitar or steak knife.**
   A curved, pointed blade. Used for accurate cutting of steaks.


Scimitar

10. **Cleaver.**
    A heavy, broad blade. Used for cutting through bones. Do not confuse a cleaver with a similarly shaped Chinese cook's knife, which is lighter in weight.


Cleaver


Chinese cook's knife

11. **Oyster knife.**
    A short, rigid, blunt knife with a dull edge. Used for opening oysters.


Oyster knife

12. **Clam knife.**
    A short, rigid, broad-bladed knife with a slight edge. Used for opening clams.


Clam knife

13. **Vegetable peeler.**
    A short tool with a slotted, swiveling blade. Used for peeling vegetables and fruits.


Vegetable peeler


Swiss-style vegetable peeler

14. **Steel.**
    Not a knife, but an essential part of the knife kit. Used for truing and maintaining knife edges (not for sharpening them—see Chapter 7).


Steel

15. **Cutting board.**
    An important partner to the knife. Hardwood boards are favored by many chefs. Hard rubber or plastic boards are thought to be more sanitary, but there is some evidence that bacteria actually survive longer on plastic and rubber than on wood. Cutting boards must be kept very clean, and they must be sanitized regularly. Color-coded composite boards are designed to help reduce cross-contamination, as each color is used for a different category of food (for example, green for vegetables, red for meats).

    Note: In some communities, wooden boards are prohibited by health regulations.

HAND TOOLS AND SMALL EQUIPMENT

1. **Ball cutter, melon ball scoop, or parisienne knife.**
   The blade is a small, cup-shaped half-sphere. Used for cutting fruits and vegetables into small balls.


Parisienne melon baller

2. **Cook's fork.**
   A heavy, two-pronged fork with a long handle. Used for lifting and turning meats and other items. Must be strong enough to hold heavy loads.


Cook's fork

3. **Straight spatula or palette knife.**
   A long, flexible blade with a rounded end. Used mostly for spreading icing on cakes and for mixing and bowl scraping.


Straight spatula

4. **Sandwich spreader.**
   A short, stubby spatula. Used for spreading fillings and spreads on sandwiches.


Sandwich spreader

5. **Offset spatula.**
   A broad blade, bent to keep the hand off hot surfaces. Used for turning and lifting eggs, pancakes, and meats on griddles, grills, sheet pans, and so on. Also used as a scraper to clean benches and griddles.


Offset spatula



Rubber spatula

6. **Rubber spatula or scraper.**
   A broad, flexible rubber or plastic tip on a long handle. Used to scrape bowls and pans. Also used for folding in egg foams and whipped cream. Heat-resistant spatulas can be used for stirring foods while cooking, but regular spatulas will melt at high heat.



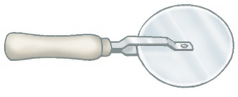
Pie server

7. **Pie server.**
   A wedge-shaped offset spatula. Used for lifting pie wedges from pan.



Bench scraper

8. **Bench scraper or dough knife.**
   A broad, stiff piece of metal with a wooden handle on one edge. Used to cut pieces of dough and to scrape workbenches.



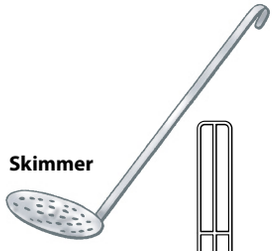
Pastry wheel

9. **Pastry wheel or wheel knife.**
   A round, rotating blade on a handle. Used for cutting rolled-out doughs and pastry and baked pizza.



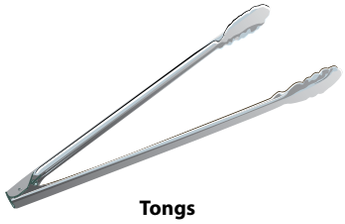
Spoons: slotted, perforated, solid

10. **Spoons: slotted, perforated, and solid.**
    Large stainless-steel spoons that hold about 3 ounces (90 mL). Used for stirring, mixing, and serving. Slotted and perforated spoons are used when liquid must be drained from solids.



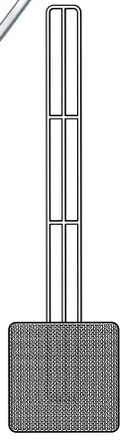
Skimmer

11. **Skimmer.**
    A perforated disk, slightly cupped, on a long handle. Used for skimming froth from liquids and for removing solid pieces from soups, stocks, and other liquids. Wire mesh versions are sometimes called ***spiders***.



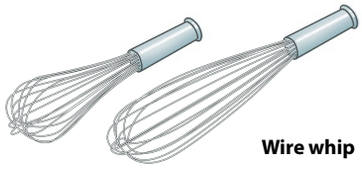
Tongs

12. **Tongs.**
    Spring-type or scissors-type tools used to pick up and handle foods.

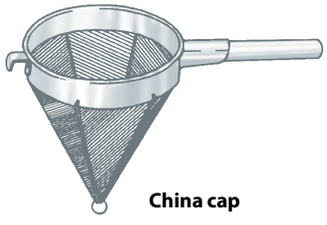


Wire mesh skimmer or spider

13. **Wire whip.**
    Loops of stainless-steel wire fastened to a handle. There are two kinds of whips (also called ***whisks***):
    - Heavy whips are straight, stiff, and have relatively few wires. Used for general mixing, stirring, and beating, especially heavy liquids.
    - Balloon whips, or piano-wire whips, have many flexible wires. Used for whipping eggs, cream, and hollandaise, and for mixing thinner liquids.

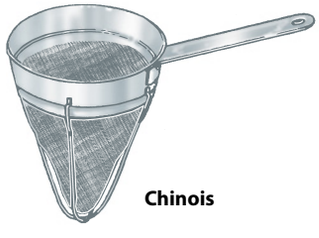


Wire whip



China cap

14. **China cap.**
    A cone-shaped strainer. Used for straining stocks, soups, sauces, and other liquids. Pointed shape allows the cook to drain liquids through a relatively small opening.



Chinois

15. **Fine china cap or chinois (shee-nwah).**
    A china cap with very fine mesh. Used when great clarity or smoothness is required in a liquid.



Strainer

16. **Strainer.**
    A round-bottomed, cup-shaped tool made of screen-type mesh or perforated metal. Used for straining pasta, vegetables, and so on.



Wire mesh strainer

17. **Drum sieve or tamis.**
    A screen-type mesh supported in a round metal frame. Used for sifting flour and other dry ingredients and for puréeing soft foods.



Sieve

18. Colander.
A large, perforated bowl made of stainless steel or aluminum. Used to drain washed or cooked vegetables, salad greens, pasta, and other foods.

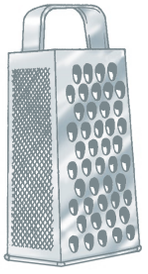


Colander

19. Food mill.
A tool with a hand-turned blade that forces foods through a perforated disk. Interchangeable disks produce varying degrees of coarseness or fineness. Used for puréeing foods.



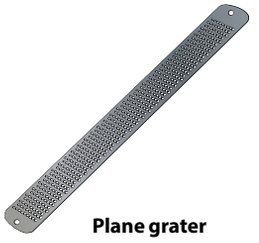
Food mill



Grater

20. Grater.
A four-sided metal box with grids of varying sizes. Used for shredding and grating vegetables, cheese, citrus rinds, and other foods.

21. Plane grater.
Usually known by the brand name Microplane. These graters shave off thin shreds of the item being grated, the way a carpenter's plane shaves wood. Available in varying degrees of fineness or coarseness.



Plane grater

22. Zester.
A small hand tool used for removing the colored part of citrus peels in thin strips.



Zester

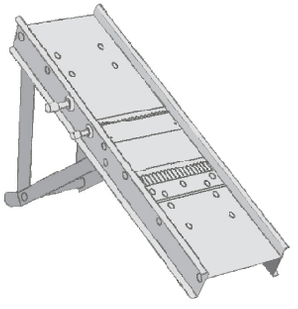
23. Channel knife.
A small hand tool used mostly in decorative work.



Channel knife

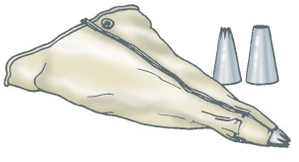
24. Mandoline.
A manual slicing implement consisting of blades fitted in a flat metal or wood framework. Folding legs position the mandoline on the worktable at a 45-degree angle for use. Levers allow the blades to be adjusted to control the thickness of the slices. A traditional mandoline has a flat blade and a serrated blade. Additional blades can be used in combination with the flat blade to cut julienne and bâtonnet. The serrated blade is used to cut gaufrette or waffle slices.

For safest use, a detachable guard is also supplied. The guard holds the food and allows it to be sliced without getting the fingers near the blades.



Mandoline

25. Pastry bag and tubes.
Cone-shaped cloths or plastic bags with an open end that can be fitted with metal tubes or tips of various shapes and sizes. Used for shaping and decorating with items such as cake icing, whipped cream, duchesse potatoes, and soft dough. Disposable plastic pastry bags are the most sanitary.



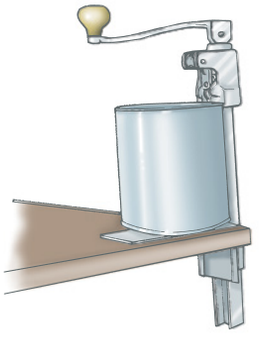
Pastry bag and tubes

26. Pastry brush.
Used to brush items with egg wash, glaze, etc.



Pastrybrush

27. Can opener.
Heavy-duty can openers are mounted on the edge of the workbench. They must be carefully cleaned and sanitized every day to prevent contamination of foods. Replace worn blades, which can leave metal shavings in the food.



Can opener



KEY POINTS TO REVIEW

- How does the metal used to make a cooking pan affect its cooking qualities?
- What equipment is used to measure most recipe ingredients?
- What are five kinds of equipment used to measure foods by volume?
- What are the parts of a chef's knife? What metals are used to make high-quality knife blades?
- What knife is the most often used in the professional kitchen? Name and describe other important knives and their purposes.