

Chapter 3

Knives, Hand Tools, and Smallwares



Essential Question

Why is it important to use the right tool when preparing food?

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Reading Prep

Before you read the chapter, interview someone in foodservice. Ask the person why it is important to know about the chapter topic and how this topic affects the workplace. Take notes during the interview. As you read the chapter, highlight the items from your notes that are discussed in the chapter.



Lesson 3.1 Knives and Hand Tools

Lesson 3.2 Smallwares

Lesson 3.1



Knives and Hand Tools

Learning Outcomes

After studying this lesson, you will be able to

- **explain** the elements of knife construction and how they relate to quality.
- **apply** techniques to sharpen and maintain an edge on a knife using a steel and whetstone.
- **use** proper knife storage and safety practices.
- **identify** various knives and hand tools used in the professional kitchen.

Content Terms

bolster

carbon steel

high-carbon stainless steel

Parisienne scoop

spider

stainless steel

steel

tang

whetstone

Academic Terms

emit

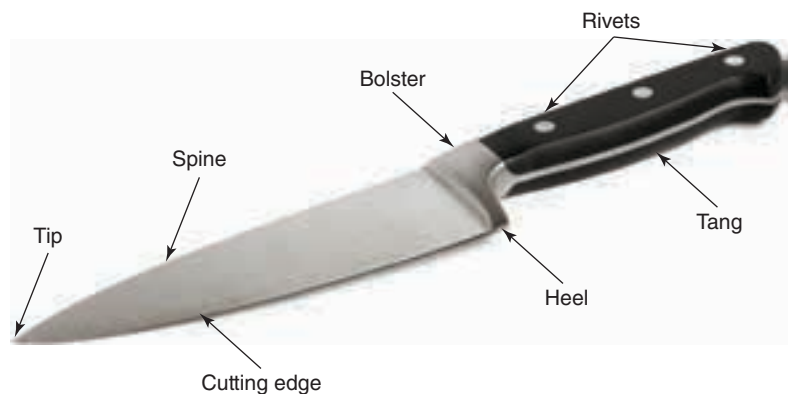
synthetic

Every trade, art, or craft has its own assortment of tools or implements used to practice the discipline. This chapter explores the qualities of a well-made knife and identifies the types of knives and hand tools found in professional kitchens. You will also learn how to sharpen knives and keep them sharp.

Knife Construction and Selection

No tool is more identified with the chef's profession than the knife, and for good reason. The knife is the chef's most important tool. Many chefs have favorite knives they have used for years. The right knife for the job becomes an extension of the chef's hand. A sharp, well-constructed knife makes the cutting task seem almost effortless. The main parts of a knife include the blade, the tang, and the handle. The parts of the blade include the tip, spine, bolster, cutting edge, and heel. Each part of the knife contributes to its durability, how it is used, and how it feels to hold (**Figure 3.1**).

One of the most important things aspiring chefs can do to develop their culinary skills is to invest in a good quality chef's knife. Cutting boards are nearly as important and must be used to keep the knives in good condition.



Olga Popova/Shutterstock.com

Figure 3.1 Understanding how knives are constructed aids a chef when selecting a quality knife.

Blade

A key factor to consider when judging the quality of a knife is the type of metal used for the blade. Kitchen knives are usually made from one of three types of metals—carbon steel, stainless steel, or high-carbon stainless steel.

Carbon steel has been used to make knives for hundreds of years. A blade made from **carbon steel** is the easiest to sharpen to a finely honed edge, but it loses its shine and discolors quickly after its first use. These knives rust if left wet or in a damp place. As a result, this type of blade sometimes transfers a metallic flavor to foods, especially acidic foods. It also causes certain foods such as lettuce and avocados to discolor more rapidly.

To solve the rust and discoloration problems with carbon steel knives, knife makers introduced stainless steel chef's knives. **Stainless steel** does not pit, rust, or discolor, and does not affect the flavor of foods. The disadvantage of stainless steel is that it is a much harder metal than carbon steel. Because stainless steel is so hard, these blades are more difficult to sharpen and keep sharp.

By the 1980s, cutlery manufacturers had arrived at a solution that combined the best properties of both carbon and stainless steels. This improved combination is called **high-carbon stainless steel**. Today, most good quality professional knives are made with high-carbon stainless steel. These knife blades are easy to sharpen and maintain, and do not rust or discolor.

Tang

Another feature to consider when selecting a quality knife is the tang. The **tang** is the portion of the knife blade that extends into the handle of the knife (**Figure 3.2**). The best-made knives have a *full tang*. A full tang extends all the way to the end of the handle as one continuous piece of metal. Less durable knives have what is called a *rattail tang*. This tang consists of a thin piece of metal—like the handle of a rattail comb—that extends into the handle of the knife. Knives with a rattail tang may be less expensive, but the blade and the handle often become loose with wear. A knife with a loose blade is not safe to use. When choosing a chef's knife, select one with a tang that extends at least three-quarters the length of the handle.

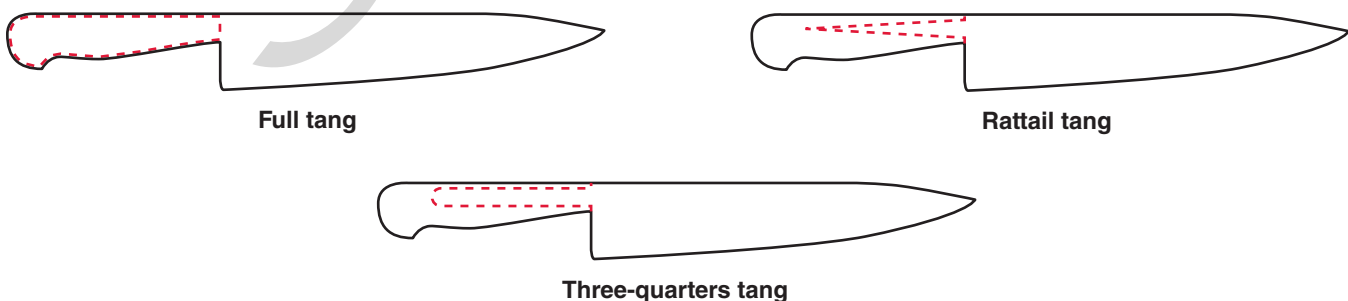


Figure 3.2 There are a variety of tangs used in knife construction. *Which of these knife blades is most likely to loosen over time?*





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Handle

Knife handles can vary in material and weight. Handles are often made from hardwoods such as rosewood and maple. Other common materials used to make handles include plastic, rubber, and composite materials. If the handle is molded onto the tang, it is hard to know the length of the tang. When choosing a knife, the material the handle is made of is important and so is the weight. The weight of the handle should be balanced with the weight of the blade. A balanced knife is more comfortable to grip and easier to use.

Bolster

More expensive knives are constructed with a bolster. A **bolster** strengthens the blade by forging it with a thick, metal collar that runs from the heel of the blade to the handle. The bolster makes the knife heavier. For this reason, many chefs prefer a knife without a bolster. The purpose of the bolster is to strengthen the blade at a stress point where knife blades often crack or chip. Even with the added strength of a bolster, a chef's knife should be used only on tasks for which it was designed. Knives should not be used to crack hard bones or open metal cans.

Knives and Their Uses	
Identification	Description
	Boning and Filet Knives The blade of a boning or filet knife is approximately 6 inches long and narrower than a chef or utility knife. Styles vary in the shape, thickness, and flexibility of the blade. The knives with the wider, more rigid blades are called <i>boning knives</i> . Boning knives are used for separating muscle from bone on meat or poultry. The thinner, more flexible blades are called <i>filet knives</i> and are often used for filleting and portioning fish.
	Chef's Knife The chef's knife, or French knife, is the most used knife in any chef's knife kit. It is used for chopping, slicing, and most other cutting tasks. Blade lengths vary between 8 and 14 inches. The 10-inch blade is the most popular. The blade is wide enough for the gripping hand to clear the work surface when cutting and chopping. The blade tapers to a point at the tip. This design allows the knife to be used for chopping by rocking it on the curved part of the blade.
	Clam Knife A clam knife is a short knife with a 1-inch-wide blade. The blade tapers to an edge, but is not sharp. This knife is not used for cutting. The blade is slipped between the top and bottom shells of the clam and used as a wedge to open it.
	Cleaver A cleaver is easily identified by its large, rectangular blade. It is used for chopping. Heavier cleavers can chop through bones.

Images courtesy of R. H. Forschner, a division of Swiss Army Brands, Inc. (Continued)

Knives and Their Uses

Identification	Description
	<p>Oyster Knife</p> <p>An oyster knife is a small knife with a narrow, rigid blade. It is not sharp, but the pointed tip is used to pry apart the top and bottom shells of oysters.</p>
	<p>Palette Knives and Spreaders</p> <p>Palette knives and spreaders come in various lengths and widths. They have flexible blades, but are not sharp. They are designed to spread coatings on foods, but may also be used as a spatula to turn items during cooking.</p>
	<p>Paring Knife</p> <p>Paring is the act of cutting away skin or peel. Paring knives are the small, short-bladed knives designed to accomplish this task. They are also useful for cutting intricate garnishes and other detail work.</p>
	<p>Scimitar</p> <p>Sometimes called a <i>butcher's knife</i>, the scimitar has a long, thick, highly curved blade. This knife is excellent for cutting steaks from large cuts of meat.</p>
	<p>Serrated Slicer</p> <p>A serrated blade has teeth like a saw. A serrated slicer is a long knife with a serrated blade. This knife is useful when cutting breads and pastries which might crumble or be crushed with a smooth blade.</p>
	<p>Slicer</p> <p>A slicer is a knife with a long, narrow, flexible blade. Using a light, sawing motion with this knife allows you to cut cooked meat and poultry into thin, even slices. Its length also makes it useful for many other jobs.</p>
	<p>Tourné Knife</p> <p>A tourné is a vegetable that has been cut into a small barrel or football shape. This variation on the paring knife with its inwardly curved blade makes the job of cutting these shapes easier.</p>
	<p>Utility Knife</p> <p>A utility knife is a smaller version of the chef's knife and is designed for lighter kitchen work. Typically, utility knives have blades between 5 and 7 inches long. Its blade is more flexible and usually not wide enough to use for chopping tasks.</p>

Images courtesy of R. H. Forschner, a division of Swiss Army Brands, Inc.

Cutting Boards

Cutting boards should always be used when cutting foods with a knife. The cutting board helps maintain the blade's cutting edge. Traditionally, chefs have preferred the use of cutting boards and butcher's blocks made from hardwoods such as maple, walnut, and cherry.



Asian Cuisine—A Different Approach to Knives

In the Chinese kitchen and in most other Asian cuisines, the knife of choice is a cleaver. A Chinese cleaver has a rectangular shape with a slightly curved blade to accommodate a rocking motion. In Asian kitchens, the cleaver is used for a wide range of tasks including boning chicken, peeling carrots, mincing garlic, and chopping scallions. Cleavers are even used as spatulas.

The Chinese cleaver is gripped and handled the same way as the chef's knife. However, Asian chefs believe that its heavier weight requires less effort than a chef's knife for cutting and chopping. Chinese cleavers come in a range of sizes for different tasks. Carbon steel is the preferred metal for Chinese cleavers because of its sharpening ability, but they must be kept clean and dry to avoid rusting.



Image courtesy of R. H. Forschner, a division of Swiss Army Brands, Inc.

Japanese chefs utilize styles of knives that are less common in Western kitchens. The santoku knife is an all-purpose knife with a flat cutting edge. They are typically no longer than 8 inches (20 cm). The blades of Japanese knives are usually honed to have a thinner blade profile. Japanese knives for fish and vegetables are also unique because they are sharpened on only one side of the blade with the other side remaining flat. In contrast, Western-style knives are sharpened on both sides. Santoku knives are traditionally made from carbon steel and are honed to a razor-sharp edge.



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Later, health departments began requiring cutting boards made from **synthetic**, or man-made materials, instead of wood boards. The wood boards were thought to be less sanitary because wood is porous. Recently, studies have shown that hardwoods are less likely to allow bacterial growth than synthetic boards. As a result, wood cutting boards are being used in commercial kitchens once again (**Figure 3.3**). Bamboo cutting boards are becoming very common as well.



Synthetic

Sergey Zhukov/Shutterstock.com



Hardwood

Pixel-Shot/Shutterstock.com

Figure 3.3 Always use a cutting board when cutting foods. *Why is it important to use a cutting board?*

Today, the decision to use wood or synthetic cutting boards is a matter of personal preference and cost. Synthetic boards are much cheaper than wood. Synthetic boards can be purchased in a range of colors. Each color is then restricted to a specific use to help avoid cross-contamination. Whichever type or color board you choose, clean and sanitize it after each use. Cutting boards come in contact with many foods and can be sources for cross-contamination. Both wood and synthetic cutting boards should be washed and sanitized after use. Wood cutting boards should not be washed and sanitized in a dishwasher, as extended exposure to moisture can cause the board to warp or crack.

Cutting boards should be smooth. When boards become scratched, gouged, or chipped, they should either be repaired or replaced.

Reading Review



1. List the main parts of a knife.
2. A knife blade made from ____ is easiest to sharpen.
3. Explain what makes a balanced knife.

Sharpening Knives

Once you select a good quality knife, it is important to keep it sharp. A dull knife is more dangerous than a sharp knife because it is harder to control and requires more force to make the desired cuts.

Some confusion exists over the roles of the two tools used to sharpen knives in the professional kitchen—the steel and the whetstone. Simply put, the **steel** is a rod used to keep the blade sharp as you work (Figure 3.4). The **whetstone** is a flat, abrasive stone used to sharpen a knife once its edge is dull and worn.

The Steel

The steel is a rod designed to remove the very small, rough, metal irregularities on the edge of the blade and to realign it. The steel requires only a moderate amount of force to hone the edge of the blade to a smooth and even cutting surface. When using the steel, the following two things are important to remember:

1. Hold the blade at the proper angle to the steel.
2. Use only moderate force when stroking the steel.

There are two ways to steel a knife blade. Both methods require that the full length of the blade, from heel to tip, be honed evenly and on both sides.

Figure 3.4 Steels may vary slightly in design.



Image courtesy of R. H. Forschner, a division of Swiss Army Brands, Inc.

TECHNIQUE Using a Steel

Method One

- 1 Begin by holding the steel in front of you and parallel to your body. Place the heel of the blade at the top end of the steel, being sure the edge of the knife is at a 20-degree angle to the steel.
- 2 By rotating the wrist of your knife hand downward, gently draw the length of the blade across the steel, ending with the tip.
- 3 Repeat the process several times on each side of the blade until the edge has a fine finish.



Method Two

- 1 Place the tip of the steel on the cutting board and grasp the handle so the steel is vertical with the handle end up.
- 2 Place the heel of the blade at the top of the steel, keeping the edge of the knife at a 20-degree angle to the steel.
- 3 With even pressure, draw the blade across the steel to the tip maintaining the 20-degree angle.
- 4 Repeat the process several times on each side of the blade until the edge has a fine finish.



Photos: Draz-Koetke/Goodheart-Willcox Publisher

A Serving of Math

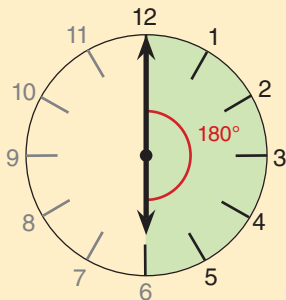


Measuring Angles

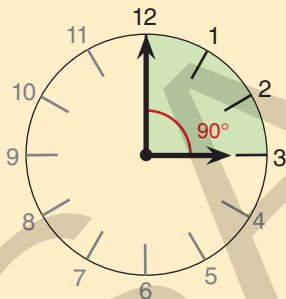
Lines are measured in inches or centimeters. Angles are measured in degrees. A full circle measures 360 degrees ($^{\circ}$).



There are many angles that make up that full circle. Try picturing a clock instead of a circle and you will be able to see and measure the angles better.



The hands of this clock create a 180° angle.



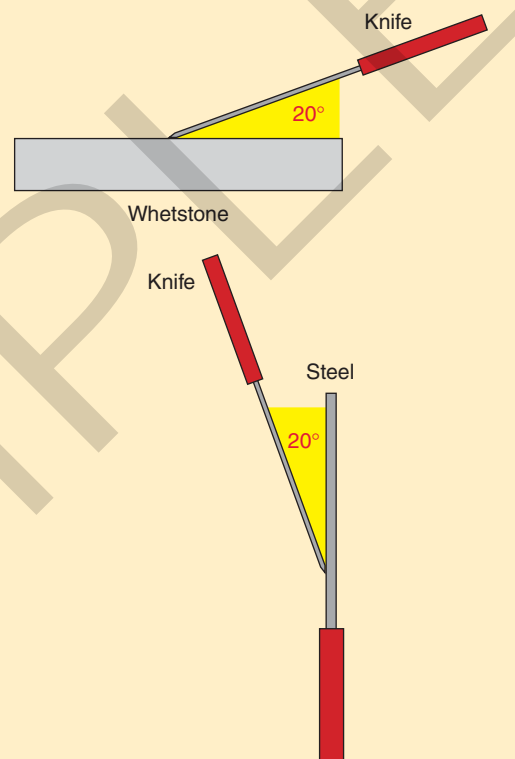
The hands of this clock create a 90° angle.



The hands of this clock create a 45° angle.



The hands of this clock create a 20° angle.



Knives must be held at a 20° angle to either a whetstone or steel. You can estimate a 20° angle by creating a 90° angle and cutting it in half. This creates a 45° angle. Next, cut the 45° angle in half. The resulting angle is approximately a 20° angle.

✓ Know and Apply

1. Identify a right (90°) angle in your surroundings.
2. Practice holding a knife blade at a 20° angle to a cutting board, whetstone, or steel. If you do not have a knife, practice with a pencil, ruler, or other straight object.

The Whetstone

The whetstone, or sharpening stone, is used to sharpen the edge of a blade that has become dull with use. Stones are made from a variety of abrasive mineral materials such as carborundum, carbide, sandstone, or ceramic. These materials act to grind and hone your knife to a sharp edge. Most stones have two sides—one rough and the other fine. The rougher side is used first to grind an edge on the blade, then the finer side is used to hone it. A *tri-stone* is a three-sided stone with a holder and lubricant reservoir. There are also machines that perform this process more quickly and companies that provide knife-sharpening service. This equipment or service can be costly. However, with a small amount of practice and an inexpensive stone, superior results can be achieved.

Lubricants

When using a stone to sharpen knives, most chefs lubricate the stone to make sharpening easier. The lubricant also helps to remove the filings of metal and mineral that are created during the sharpening process. Water and mineral oil are the lubricants typically used for sharpening in the professional kitchen. Water is a less effective lubricant than oil, but it is readily available. Mineral oil is favored because it does not become sticky or gummy from friction as vegetable oil does. Because mineral oil is digestible, there is no fear of chemically contaminating foods as with petroleum-based oils.

Sharpening stones are porous and, therefore, they absorb some lubricant. For this reason, once oil is used on a stone, water will not work as a lubricant on that stone.

TECHNIQUE Using a Whetstone

- 1 Place the sharpening stone on a wet towel or rubber mat to prevent it from slipping during the sharpening process. Begin with the coarsest side of the stone.
- 2 If you are using a lubricant, saturate the surface of the stone with an even layer of water or mineral oil.
- 3 Hold the knife at a 20-degree angle to the surface of the stone.
- 4 Maintain a 20-degree angle as you begin with the heel of the blade in the upper left-hand corner of the stone.



Photos: Draz-Koetke/Goodheart-Willcox Publisher

(Continued)

TECHNIQUE Using a Whetstone

- 5 Draw the knife down and across the stone until the tip of the knife is on the lower right-hand corner of the stone. Be sure to maintain even pressure on all parts of the blade throughout the process.
- 6 Repeat the process on the other side of the blade. Begin with the heel in the upper-right corner of the stone and finish with the tip in the lower-left corner.
- 7 Repeat the process 5 to 10 times depending on the dullness of the blade. Apply equal pressure to all parts of the blade and an equal number of strokes to each side of the blade.
- 8 Turn the stone to its finer side, lubricate it, and repeat steps three through six.
- 9 To finish the edge, hone it on the steel as illustrated previously.



Photos: Draz-Koetke/Goodheart-Willcox Publisher

Reading Review

1. The _____ is used to sharpen a dull, worn knife blade.
2. List the two lubricants that are used on whetstones in the professional kitchen.
3. A knife should be held at a _____-degree angle to the whetstone or steel when sharpening or honing.



Knife Storage and Safety

Storing knives correctly accomplishes two goals—protects the knife and prevents injuries. Before storing a knife, it must be cleaned, rinsed, sanitized, and dried. Some knives may be washed in a commercial dishmachine. This is often done with lower-priced knives. High-quality knives should never be washed in a dishmachine to avoid damage over time.

Knives should not be stored loose in a drawer. This is unsafe and knives become dull from contact with other knives. Acceptable knife storage options include the following:

- drawer with a knife sheath on each knife
- knife roll with a sheath on each knife in case the knife falls out when the roll is opened
- knife holder which can be cleaned and sanitized
- knife cabinet

Knife holders must be cleaned and sanitized on a regular basis. Some knife cabinets **emit**, or give off, UV rays that sanitize the knives as they are stored. Some of these options can be locked for added security.

Knives are a necessary part of working in a professional kitchen; however, they are also dangerous if not handled safely (**Figure 3.5**). One of the most important safety considerations in a commercial kitchen is keeping the cutting tools in top condition. Beginner cooks may be afraid of a razor-sharp chef's knife, but a sharp knife is safer than a dull one. A sharp blade means the knife cuts more cleanly and accurately. Most importantly, with a sharp knife the cook has greater control. Most accidents with knives occur when the user loses control because the blade slips or bounces off the surface being cut. A sharp knife also requires less force to cut the desired product, which also aids in control and reduces fatigue.

Before working with a knife, be sure that you are trained on proper technique and safety by a supervisor. The supervisor should verify that each employee has been trained and demonstrated proper use of each piece of kitchen equipment, including knives. This written record is kept on file by the employer.

Figure 3.5 Safe Knife Handling

Do's:	Don'ts:
<ul style="list-style-type: none"> • Keep knives sharpened and inform others when knives are newly sharpened. • Use a knife only for its intended purpose. • Use the appropriate knife for the job. • Carry knives with the cutting edge slightly away from your body. • Store knives properly in racks or knife sheaths. 	<ul style="list-style-type: none"> • Touch knife blades. • Try to catch a falling knife—let it fall. • Hand a knife to someone. Instead, place on the counter and let him or her pick it up. • Leave a knife soaking in a sink of water. • Talk to people while using a knife.

Source: Occupational Safety & Health Administration



Reading Review

1. List three ways to correctly store knives.
2. Identify five rules of knife safety.



Hand Tools

A wide variety of hand tools are used in commercial kitchens. These devices perform many useful tasks. Foodservice professionals must be able to identify and use these tools.

Hand Tools	
Identification	Description
	<p>Peelers</p> <p>Peelers are used to remove the skins of fruits and vegetables. There are two main styles of peelers—stationary and swivel. The stationary peeler is a slit blade with a sharpened edge mounted on a handle. The blade of most stationary peelers can also be used to core apples. Swivel peelers have their blade mounted to the handle so they swivel or rock. The ability to swivel makes it easier to keep the blade in contact with the surface of the item being peeled.</p>
	<p>Whip (Whisk)</p> <p>The terms <i>whip</i> and <i>whisk</i> are both used to refer to an implement of looped wire attached to a handle. The purpose of this tool is to incorporate air into a mixture or blend ingredients. Whips or whisks come in a variety of sizes. Their wires may be flexible for incorporating more air into a thinner substance, or rigid for mixing thicker substances. Kitchens should have a variety of sizes and styles for a variety of jobs.</p>

Meat fork, Parisienne scoop, zester, channel knife, garnishing knives: Images courtesy of R. H. Forschner, a division of Swiss Army Brands, Inc.; All other images: Draz-Koetke/Goodheart-Willcox Publisher (Continued)

Hand Tools

Identification	Description
	<p>Meat Fork</p> <p>A heavy-duty fork with two long tines is used by chefs to turn large pieces of meat during cooking and to hold the meat when carving. The fork is also used to test for doneness.</p>
	<p>Tongs</p> <p>Metal spring tongs are used widely in the professional kitchen. Tongs act as an extension of the hand for handling food items of all sorts.</p>
	<p>Parisienne Scoops</p> <p>Home cooks call this scoop a <i>melon baller</i>. Professional cooks refer to this utensil as a Parisienne scoop. The name is derived from the classical preparation of potatoes Parisienne, which are scooped into small balls. Parisienne scoops are available in a variety of sizes and can form a great number of foods into appealing garnishes.</p>
	<p>Spider</p> <p>A spider is a long-handled tool used to strain or lift items out of liquid. The name comes from the fact that the mesh disc at the end of the handle resembles a spider's web.</p>
	<p>Skimmer</p> <p>The flat, perforated disk on the working end of a skimmer is designed to remove impurities that form scum on the surface of simmering liquids. It can also be used to perform the same tasks as a spider.</p>
	<p>Ladles</p> <p>Ladles are used for portioning liquid products and come in a wide range of sizes. The volume capacity of a ladle is usually imprinted on its handle.</p>
	<p>Kitchen Spoons</p> <p>Sturdy stainless steel spoons can be solid, slotted, or perforated. Slotted and perforated spoons are used for draining wet products.</p>

Meat fork, Parisienne scoop, zester, channel knife, garnishing knives: Images courtesy of R. H. Forscher, a division of Swiss Army Brands, Inc.; All other images: Draz-Koetke/Goodheart-Willcox Publisher (Continued)

Hand Tools

Identification	Description
	Offset Spatulas One of the most commonly used tools in the kitchen, this metal spatula has a wide blade with an offset handle. The offset spatula, or hamburger turner, is used to lift, turn, and carry food items. They are available in a variety of sizes and thicknesses. Some models are perforated to allow for draining a food product.
	Spatulas and Scrapers A spatula is a flexible blade on a long handle. Blades may be made from silicon, rubber, vinyl, or other materials. This hand tool helps the cook remove food product from a container. Heat-resistant spatulas are also used for cooking in nonstick pans to avoid scratching their finish. Bakers and pastry chefs also utilize a plain, plastic blade without a handle called a <i>scraper</i> . This tool is particularly useful for scraping down large mixing bowls.
	Channel Knife Channel knives are tools that cut a decorative groove in the surface of fruits and vegetables.
	Garnishing Knives Garnishing knives are V- or U-shaped chisels that are used to carve decorations from fruits and vegetables.
	Zester A zester is a tool that is designed to remove fine strips of the outer rind of citrus fruits.

Meat fork, Parisienne scoop, zester, channel knife, garnishing knives: Images courtesy of R. H. Forschner, a division of Swiss Army Brands, Inc.; All other images: Draz-Koetke/Goodheart-Willcox Publisher

Reading Review

1. Identify the best hand tool to use for each of the following tasks:
(A) removing green beans from boiling water, (B) removing the skin from an apple, (C) incorporating air into egg whites, (D) turning hamburgers on the grill.





Smallwares

Learning Outcomes

After studying this lesson, you will be able to

- **identify** various cookware used in commercial kitchens.
- **compare** the properties of various materials used to make cookware.
- **select** appropriate smallwares for various measuring and portioning tasks, and various cooking methods.
- **summarize** proper storage of smallwares.
- **explain** safety procedures when using smallwares and preparation equipment.

Content Terms

bain marie
china cap
chinois
colander
conduction

cookware
hotel pans
mandoline
pan
pot

rondeau
sauteuse
sautoir
sheet pans
smallwares

Academic Term

inverted

A variety of smallwares and preparation equipment is used in kitchens to make work more efficient. **Smallwares** are the pots, pans, and other hand tools used to prepare food. Cooks have a wide range of equipment to choose from when preparing menu items. However, using the right tool for the job not only makes work easier, but also turns out a better end product.

Cookware

There is a wide variety of cookware used in the professional kitchen. **Cookware** is the term for the various pots and pans used when cooking. Choosing the right pot or pan to cook a certain dish may be critical to a good finished dish. Although many people use the words *pot* and *pan* interchangeably, there is a difference between the two. A **pot** is a cooking container that is as tall, or taller, than it is wide. A **pan** is wider than it is tall.

Materials Used in Cookware

Pots and pans are available in a variety of materials. Different materials have different properties that affect how well foods cook. One of the most important factors when selecting cookware is conduction.

Conduction is the transfer of heat through a material. The ability of a pot or pan to transfer heat from the burner or oven to the food it contains is affected by the material used to make the pot or pan. The most common cookware materials in commercial kitchens are copper, stainless steel, and aluminum. These materials vary in their ability to transfer heat.

Copper

Copper has long been considered the best material for pots and pans because it is an excellent conductor of heat. As a result, cookware made with copper cooks items quickly and evenly. It has a number of drawbacks as well. Copper cookware is expensive and rather heavy. Extra work is needed to keep it clean and shiny because it tarnishes. Another disadvantage is that copper reacts with certain foods. For this reason, most copper cookware is lined with another metal such as stainless steel.



Copper

Draz-Koetke/Goodheart-Willcox Publisher

Aluminum

Aluminum is a widely used material for commercial cookware. Its main advantage is that it costs less than copper or stainless steel. Additionally, aluminum cookware usually weighs less than pots and pans made with copper and stainless. It is a good conductor of heat, though it does not conduct heat as well as copper. Thick-gauge aluminum pots heat more evenly than thin-gauge aluminum pots. One disadvantage of aluminum is that it can discolor some food preparations.



Aluminum

Draz-Koetke/Goodheart-Willcox Publisher

Stainless Steel

Pots and pans made from stainless steel are slightly less expensive and a bit lighter than copper cookware. One benefit of stainless steel is that it does not tarnish like copper. However, stainless does not conduct heat as well as copper or aluminum. It is a poor heat conductor and creates a cooking surface with hot spots, or uneven heating. The best stainless cookware has heavy copper or aluminum bottoms for better conduction.



Stainless steel

Draz-Koetke/Goodheart-Willcox Publisher

Other Materials Used in Cookware

Carbon steel, also known as *black steel*, is used to make sauté, frying, and roasting pans. It conducts heat well but rusts if left wet. Carbon steel can also give off a metallic taste if used to cook acidic foods.

Another material sometimes used in cookware is cast iron. It is an excellent conductor of heat. The most frequent use of cast iron is in frying pans. Unfortunately, cast iron is extremely heavy and may crack or chip if dropped. Like carbon steel, it is prone to rusting if not cared for properly.

In the professional kitchen, pots and pans get heavy use and rough handling. Due to their fragile nature, glass and ceramic cookware are rarely used in commercial kitchens. Whatever material you choose, look for well-made pots and pans with thick-gauge metal and sturdy construction. Thinner metal results in uneven heating and buckles over time. Handles should be attached with strong rivets or welds to extend the useful life of the cookware and prevent leaking.




Types of Cookware

In addition to the material used, the size and shape of the cookware is an important consideration. Chefs must be familiar with the many different pots and pans and their intended uses.

Cookware			
Identification	Description	Identification	Description
	<p>Braising Pan</p> <p>A braising pan, or <i>braisière</i>, is a high-sided square or rectangular pan with a tight-fitting lid. It is designed for cooking items first on the stovetop and then covered in the oven.</p>		<p>Cast-Iron Skillet</p> <p>A cast-iron skillet is a frying pan made of heavy cast iron. Some chefs call it a "Griswold." It is excellent for panfrying.</p>
	<p>Double Boiler</p> <p>A double boiler is a set of two nesting pots. The lower pot is used to heat water, which warms or cooks the ingredients in the top pot. Double boilers are used to cook ingredients that require indirect or gentle heat.</p>		<p>Roasting Pan</p> <p>A roasting pan is a large rectangular metal pan with 2- to 5-inch (5 to 12 cm) sides used for roasting and baking.</p>
	<p>Rondeau</p> <p>A rondeau (rahn DOH) is a wide pan with 6- to 8-inch (15 to 21 cm) sides and two looped handles. It can accommodate a large amount of product and is especially useful for braising.</p>		<p>Saucepan</p> <p>A saucepan is smaller than a saucepot. It has a single, long handle. A saucepan may have either straight sides or flared sides.</p>
	<p>Saucepot</p> <p>A saucepot is like a stockpot but not as wide or tall. This straight-sided pot may come with one long handle or two looped handles. Saucepots are used for a wide variety of cooking tasks.</p>		<p>Sauteuse</p> <p>A sauteuse (saw-TOOZ) is a sauté pan with sloped or rounded sides. Its shape makes it easy to toss or flip products when sautéing.</p>

Photos: Draz-Koetke/Goodheart-Willcox Publisher (Continued)

Cookware

Identification	Description
	<p>Sautoir</p> <p>A sauté pan with straight sides is called a sautoir (saw TWAHR). Its shape makes it most effective for panfrying.</p>
	<p>Stockpot</p> <p>A stockpot is a large, tall-sided pot used mainly for cooking stocks and soups. Stockpots may have a spigot or valve at the base for easier draining.</p>
	<p>Wok</p> <p>A wok is a bowl-shaped pan of Asian origin used for stir-frying. Its shape makes it possible to achieve intense heat at the cooking surface and cook with a small amount of oil. Most traditional woks are made of black steel and must be brushed with oil and stored dry when not in use.</p>

Photos: Draz-Koetke/Goodheart-Willcox Publisher

Hotel Pans

Hotel pans, also called *steam table pans*, are rectangular stainless steel pans used to hold food in steam tables, warmers, and refrigerators. The standard full-size hotel pan measures 12 by 20 inches (30.5 by 51 cm). Hotel pans are available in depths of 2½, 4, and 6 inches (5, 10, and 15 cm). Pans that are a fraction of the size of a full pan are also used in kitchens (**Figure 3.6**). These smaller pans can be purchased in any of the three depths discussed. Commercial foodservice equipment is designed to accommodate the standard dimensions of hotel pans.



Hotel pan

Draz-Koetke/Goodheart-Willcox Publisher

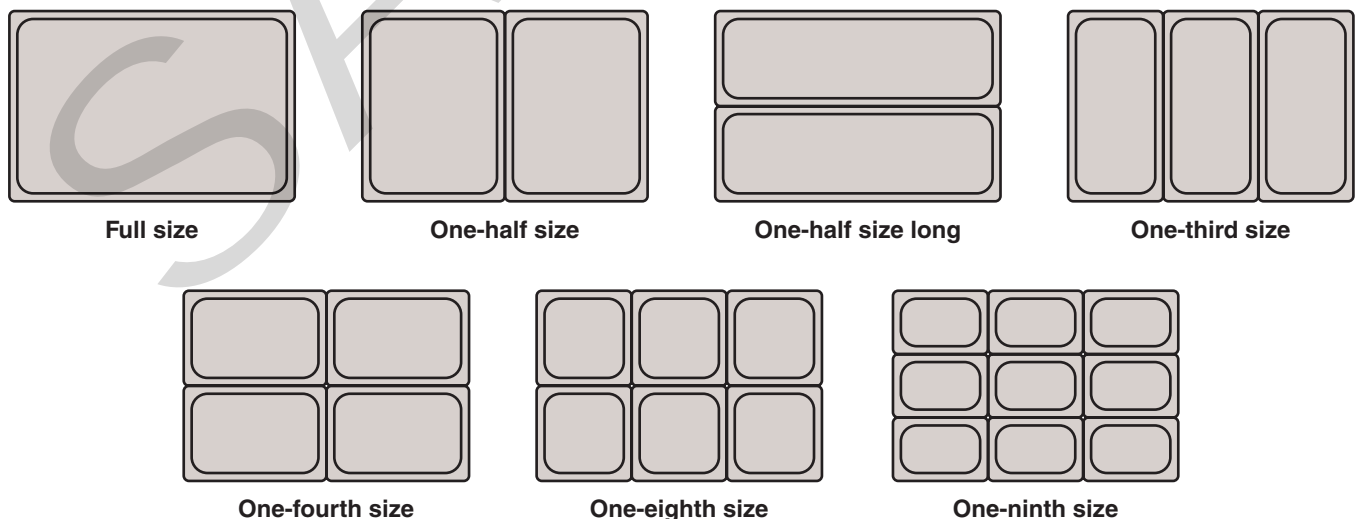


Figure 3.6 There are many ways these pan sizes can be combined to fit in the standard opening for a steam table. *What is a combination of pan sizes not shown in this figure?*

A Serving of Math



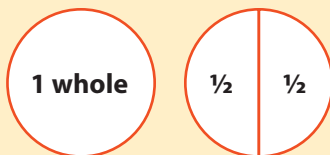
Fractions

Most cooks use fractions when converting or preparing recipes.

What Is a Fraction?

Fractions represent equal parts of a whole. When a whole is divided into equal parts, each part is a fraction of the whole. So, a fraction tells you how many parts of the whole you have.

In the following image, one whole is divided into two equal parts. Each part is one-half ($\frac{1}{2}$).



Fractions can be written either with a slanted slash (/) between the numbers or with one number on top of a horizontal slash (–) and the other number under the slash:

$$\frac{1}{2} \text{ or } \frac{1}{2}$$

The top number is called a *numerator* and the bottom number is called a *denominator*. In the example above, 1 is the numerator and 2 is the denominator. The denominator represents the number of equal parts into which the whole unit

is divided. The numerator describes how many parts of the whole unit are being counted.

Types of Fractions

A *proper fraction* has a denominator that is greater than the numerator.

$$\frac{3}{4}$$

An *improper fraction* has a numerator that is greater than the denominator.

$$\frac{4}{3}$$

Mixed numbers are a combination of a whole number and a fraction.

$$1\frac{1}{3}$$

✓ Know and Apply

1. In the fraction $\frac{5}{8}$, what number is the numerator? What number is the denominator?
2. What fraction is represented by the shaded part in the circle?



Sheet pan

Draz-Koetke/Goodheart-Willcox Publisher

Sheet Pans

Large, shallow pans called **sheet pans** are used for baking and food storage. A standard-size sheet pan is 18 by 24 inches (45 by 60 cm). Sheet pans are most often made of aluminum. Commercial ovens, refrigerators, and carts are designed to accommodate sheet pans. A half-size sheet pan, 18 by 12 inches (45 by 30 cm), is also commonly used.

Bowls

Commercial kitchens need a variety of sizes of bowls for mixing and storage of products. Mixing bowls are made of stainless steel for durability and to avoid reaction with acidic ingredients.



Mixing bowls

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A Serving of History



Bain Marie

Chefs did not invent the bain marie. Alchemists—people who tried to make gold from other metals—were the first ones to use the device. Bain marie means “Mary’s Bath.” Some historians say that it was named for Moses’ sister Mary who was an alchemist. Today in commercial kitchens, the term *bain marie* has a number of meanings. Most often it refers to the gentle heat that a simmering water bath can provide. The term is also used to describe the following:

- *Double boiler*—a pot nested on top of another pot that is filled with simmering water.
- *Steam table*—a metal table with cutouts containing wells filled with simmering water into which pans are placed to keep warm.
- *Steam table insert*—pans or cylindrical containers used to hold foods in a steam table well.

- *Water bath for baking*—a pan about one-third full of water into which food items in baking dishes are placed. The pan is placed in the oven to bake. This method is used for food that requires slow, gentle baking.
- *Ice bath*—a pan filled with ice or cold water into which containers of food are placed in order to cool more quickly.

✓ Research

Research to learn more about alchemists and how they used the bain marie. Briefly describe what you learn. Based on what you learn, propose another name for this piece of equipment.

Bain Marie Inserts

A **bain marie** (bay mahr EE) is a hot water bath used to cook foods gently. The food to be cooked is placed in an insert. The insert is placed in a steam table or ice bath. Typically, the inserts are tall, cylinder-shaped containers made of stainless steel.

Reading Review

1. Why is the material cookware is made from important?
2. Carbon steel is a good conductor of heat but gives off a metallic taste when used to cook ___ foods.
3. List the professional names for the following cookware: (A) straight-sided sauté pan, (B) sauté pan with sloped sides, (C) tall, cylindrical containers placed in steam tables or ice baths.



Bain marie

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Measuring Equipment

A good deal of weighing and measuring takes place in commercial kitchens. Following a recipe requires that ingredients be measured accurately. Chefs have a variety of measuring equipment to help them perform their job.

Measuring Cups and Pitchers

Containers used for measuring volume come in a variety of sizes and shapes. Their capacities range from one cup to several gallons.



Measuring cups

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Measuring spoons

Draz-Koetke/Goodheart-Willcox Publisher



Portion scales

Draz-Koetke/Goodheart-Willcox Publisher



Balance-beam scale

Draz-Koetke/Goodheart-Willcox Publisher



Receiving scale

Draz-Koetke/Goodheart-Willcox Publisher

Measuring Spoons

A set of graduated measuring spoons typically consists of spoons ranging in capacity from one-eighth teaspoon up to one tablespoon. Sets of measuring spoons are useful for measuring small amounts of ingredients such as herbs and spices.

Scales

Portioning product by weight is one of the most important tasks in a professional kitchen. There are a variety of different types of scales used in commercial foodservice.

Portion Scale

A portion scale is a small scale used for weighing smaller quantities and individual ingredients. Portion scales are available as mechanical spring-type scales or as electronic scales with digital readout.

Balance-Beam Scale

A balance-beam scale is a scale with two balanced platforms. Ingredients to be weighed are placed on one platform and counterweights are placed on the other. This type of scale is popular with bakers and pastry chefs because of its capacity to weigh large amounts of dry ingredients.

Receiving Scale

Most foodservice operations use a large-capacity scale to weigh big quantities of products when they are delivered. Some receiving scales have a capacity of several hundred pounds. These scales are available in both mechanical and electronic models.

Chef's Notes



Weighing Ingredients

Tare weight is the weight of the container used to hold a product that is to be weighed. The tare might be the weight of a cardboard box holding loins of beef or the weight of a bowl holding flour. Most scales make the task of weighing easier by allowing you to adjust for the tare weight. Place the empty container on the scale and reset the scale to zero. When you place the product to be weighed on the scale in the container, the scale reading will reflect only the product weight and not the container weight. This method eliminates the chance for math errors that could result when subtracting the tare weight from the total weight.

Thermometers

Thermometers are used to measure temperatures during cooking, holding, and cooling. This tool is essential for ensuring safe food-handling practices. Several types of thermometers are commonly used in professional kitchens.

Bimetallic-Coil Thermometer

Bimetallic-coil thermometers use a coil made from two metals contained in the probe to measure temperature. There are two types of these thermometers—oven safe or instant read. The oven-safe thermometer takes one to two minutes to register the temperature and is often used for roasts or large pieces of meat. An instant-read thermometer is a smaller thermometer that registers temperature within a few seconds. It is widely used for a variety of temperature monitoring tasks. Its temperature range is 0°F to 220°F (−18°C to 104°C).

Candy Thermometer

A candy thermometer, also known as a *deep-fat thermometer*, is used to measure the higher temperatures used when cooking sugar and deep-frying. This class of thermometers measures temperatures as high as 400°F (204°C).



Infrared thermometer

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Infrared Thermometer

Infrared thermometers work by aiming a beam of laser light onto a small spot on the surface of an object. The infrared energy reflected from that spot travels back through the lens of the thermometer to measure the surface temperature. Temperatures can be measured from a distance without touching the product. One limitation of infrared thermometers is that they only measure the temperature on the surface and not internally.

Thermocouple Thermometer

The thermocouple thermometer is a style of instant-read thermometer that utilizes a probe connected to an electronic meter. The meter provides a digital display of the temperature. Some thermocouple probes can be placed in an oven and the meter placed outside where the cooking process can be continually monitored.



Instant-read thermometer

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Candy thermometer

Draz-Koetke/Goodheart-Willcox Publisher



Thermocouple thermometers

Draz-Koetke/Goodheart-Willcox Publisher

Reading Review



1. Identify the best piece of equipment to perform the following tasks:
 - A. Measuring one-half teaspoon of salt.
 - B. Measuring one-half gallon of milk.
 - C. Checking the doneness of a beef roast after it is removed from the oven.
 - D. Checking the temperature of oil in a deep-fat fryer.

Straining Equipment

Smallwares designed to strain and drain food products come in many interesting shapes and sizes. These tools help chefs separate solid from liquid, larger particles from smaller, and sometimes change the product consistency.

Straining Equipment			
Identification	Description	Identification	Description
	<p>Cheesecloth</p> <p>Cheesecloth is a cotton, gauze-like material. It is sometimes used in place of a chinois. Small pieces of cheesecloth are also used to make bags to hold herbs and spices for flavoring stocks and other foods.</p>		<p>China Cap</p> <p>A china cap is a cone-shaped strainer used to remove lumps and particles from liquids such as sauces. They are typically made from stainless steel. China caps can range in overall size as well as the size of the holes used to strain the product.</p>
	<p>Chinois</p> <p>A chinois (SHEEN wah) is a type of china cap that has a finely woven, metal mesh. It is used for removing small particles from sauces.</p>		<p>Colander</p> <p>A colander is a large bowl-shaped strainer used to drain large quantities of product.</p>
	<p>Drum Sieve</p> <p>A drum sieve is a metal or nylon mesh screen stretched over a circular metal or wooden frame. It is used for sifting large quantities of dry ingredients or for straining puréed foods to remove lumps.</p>		<p>Food Mill</p> <p>A food mill is a strainer used to purée soft foods. A hand-cranked paddle pushes the food through a strainer. Most food mills have interchangeable strainers of varying sizes.</p>
	<p>Ricer</p> <p>A ricer is a cylindrical, metal sieve with an attached plunger. Cooked foods, usually potatoes, are placed in the sieve and forced through with the plunger to form small rice-shaped pieces.</p>		<p>Strainer</p> <p>There are many different shapes and sizes of handheld sieves made of mesh or perforated metal.</p>

Photos: Draz-Koetke/Goodheart-Willcox Publisher

Cutting and Processing Equipment

Chefs serve foods in many different sizes, shapes, and consistencies. They use a range of tools to help them produce that variety.

Graters

A grater is a single plate with a series of teeth or a hollow, metal box with different size teeth on each side. It is used for shredding vegetables, cheese, chocolate, citrus peel, and spices.

A rasp is a handheld grater that is becoming more popular. This tool is useful for zesting citrus fruits. It is often used to very finely grate spices, hard cheeses, baking chocolates, or garlic.



Rasp

PRILL/Shutterstock.com

Mandoline

A **mandoline** is a device used to slice food by pushing the food onto and across a sharp metal blade. The plate on which the product is pushed into the blade can be adjusted to increase or decrease the thickness of the slice. Additionally, teeth can be added to the slicing blade to create stick cuts or juliennes. Mandolines are equipped with a carriage or hand guard for safely holding the product while slicing.

Food Processors

A food processor is a tabletop machine with a motorized base and a variety of bowls and blade attachments. This equipment is used primarily to grind, purée, and blend. However, cutting attachments can be used that produce shredded, julienned, and diced foods in a wide range of sizes.

Blenders

There are various types of machines that employ blades moving at high velocities for mixing, puréeing, and liquefying fluid or semifluid foods. Commercial blenders come in two basic designs—bar blenders and immersion blenders.

Bar Blender

A bar blender is a two-part machine consisting of a motorized base and a covered container. The blades that process the product are located in the bottom of the container. The food to be processed is placed in the container and a lid covers the top to prevent splash.



Box grater

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Mandoline

Draz-Koetke/Goodheart-Willcox Publisher



Food processor

Draz-Koetke/Goodheart-Willcox Publisher



Bar blender

Immersion blender

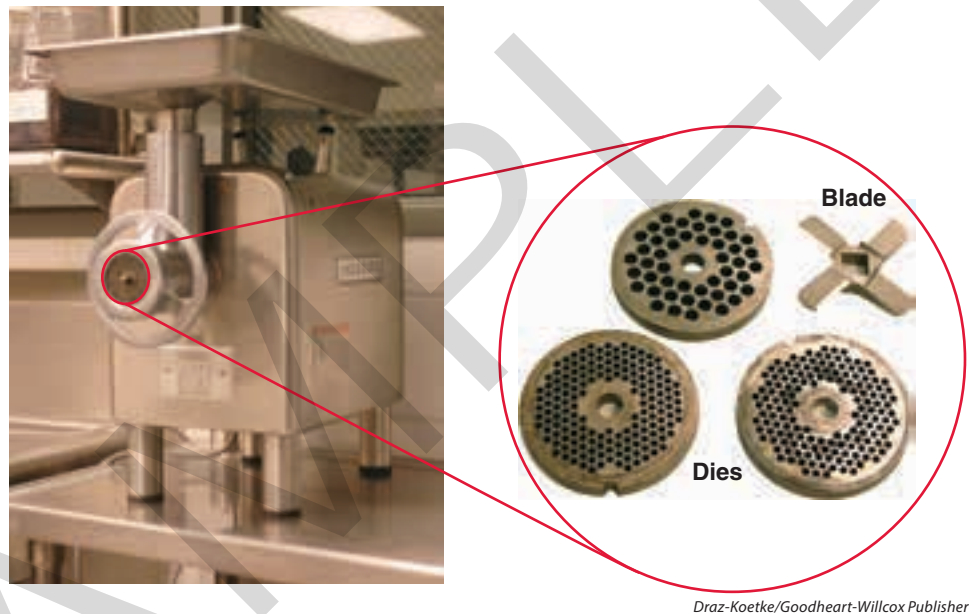
Draz-Koetke/Goodheart-Willcox Publisher

Immersion Blender

An immersion blender, or stick blender, is a one-piece machine consisting of a motorized shaft with blades on the end. The shaft and the blades are immersed in a container of liquid such as a pot of soup. This handheld blender mixes or purées the product in the container in which it was prepared.

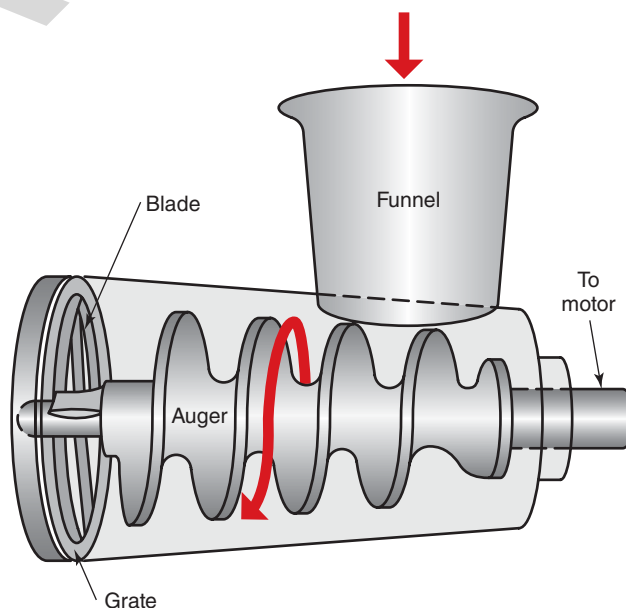
Meat Grinder

A meat grinder is a machine or attachment used to grind meat or other foods into various textures. An auger forces the food through a tube, past a rotating blade, and through the holes of the die (Figure 3.7). Different size dies can be used to produce the desired end product. Never use your hands to push product through the funnel into the tube. A plastic plunger should always be used for this task.



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Figure 3.7 The food to be ground is fed through the funnel into the grinder. The auger propels the food forward in the tube, and the blades force the food through the die. *What affects the size of the ground food particles?*



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Chef's Notes



Sharp Blades!

One of the keys to maintaining food-processing equipment such as slicers, grinders, choppers, and food processors in peak performance is keeping the blades sharp. Blades should be sharpened regularly since a dull blade will produce a poor product. Most slicers have a sharpening device attached to them. Many others need to be sent to a professional sharpening service.



Buffalo chopper

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Buffalo Chopper

A *buffalo chopper*, also called a “bowl chopper,” is a machine used for chopping large quantities of food. The machine consists of a rotating bowl into which the food is placed. The bowl then passes under a set of rotating blades that chop the food into small pieces.

Slicer

A slicer uses a rotating blade to slice foods thinly and evenly. A carriage holds the food being sliced to allow hands to stay clear of the blades. Care should be taken when using, assembling, or cleaning slicing machines due to the risk of injury.



Slicer

135pixels/Shutterstock.com

Reading Review



1. Cheesecloth can be used in place of a _____ for straining out fine particles.
2. *True or false?* A mandoline is a piece of equipment commonly used to purée foods.
3. Identify the best tool(s) for the following tasks:
 - A. Shredding cheese.
 - B. Puréeing cooked carrots.
4. A(n) _____ blender is used to mix or purée food in the container in which it was prepared.

Smallwares Storage

Before storing any smallwares, they must be cleaned, rinsed, sanitized, and allowed to dry. Often, smallwares are hung up in a kitchen to make them easily accessible. They may also be stored in drawers or on shelves. If they are stored in drawers, be sure the drawers are labeled to make the smallwares easy to find, which is important in the fast-paced kitchen. If bowls, pots, and pans are stored on a shelf, they must be **inverted**, or turned upside down. Drawers and shelving units should be routinely cleaned and sanitized.

Kitchen Equipment Safety

Just as with knives, there are many pieces of equipment in the kitchen that are dangerous if improperly used. According to OSHA regulations, people under 18 years of age are not permitted to operate, clean, or repair power equipment such as meat slicers or bakery mixers. Before working with any dangerous equipment, be sure to

- obtain training on its proper use and safety,
- wear any personal protective equipment provided by the employer,
- use any machine guarding provided,
- ask for help if you are not sure how to do something,
- be aware that age restrictions exist for workers under the age of 18 for using or cleaning certain equipment, and
- follow the manufacturer’s instructions for machine use and cleaning.

The employer should verify that each employee has been trained and demonstrated proper use of each dangerous piece of equipment. A written record of the training is kept on file by the employer.

OSHA suggests following some general safety recommendations to identify and avoid possible hazards when working with kitchen equipment (**Figure 3.8**). Report any malfunctions—never try to fix machine jams or malfunctions yourself. Disconnect the power source, follow the lockout/tagout procedure, and report problems immediately to a supervisor. The *lockout/tagout procedure* describes the steps taken to label equipment that is malfunctioning and prevent its use.

Reading Review



1. *True or false?* Pots and pans should be stored right-side up on a shelf.
2. List three safety recommendations to follow when operating food processors or mixers.

Figure 3.8 Kitchen Equipment Safety	
Mincers, Choppers, Dicers, Slicers:	Food Processors and Mixers:
<ul style="list-style-type: none"> • Always use push sticks or tamps to feed or remove food from these types of machines. DO NOT use your hands to feed smaller pieces of meat through slicers. • Make sure you use any machine guarding that is provided to prevent access to cutter blades. DO NOT bypass safety guards. • DO NOT open up or put your hands into an operating machine to stir contents or guide food. • Turn off and unplug a machine before disassembling and cleaning. 	<ul style="list-style-type: none"> • DO NOT attempt to remove items (for example, a spoon that falls into the mixture) from dough while the machine is mixing. • DO NOT open the lids of processors to stir contents while food is processing. • Make sure the processor is off before opening the lid or adding items. • Turn off and unplug machinery before cleaning or removing a blockage. • Use any machine guards provided.

Source: Occupational Safety and Health Administration

Summary Points

Lesson 3.1 Knives and Hand Tools

- Knives are the most used tools in the commercial kitchen. Choosing the right knife for a particular cutting job makes the task safer and easier.
- Maintaining a sharp blade on knives is essential for safety. Knives can be kept sharp using a whetstone and steel.
- Storing knives correctly protects the knives' blades and the cook's safety.
- Chefs use a wide variety of hand tools. Using the right tool for a particular job saves time and effort.

Lesson 3.2 Smallwares

- Selecting the right piece of equipment is important when preparing food. Chefs must consider the material used in the cookware as well as the type of pot or pan best suited to the job.
- Many pieces of equipment exist that help cooks measure weights, volumes, and temperatures.
- Straining equipment varies depending on the particle sizes to be strained out and the end product desired.
- Cutting and processing equipment can range from simple, handheld tools to complex, motorized machines.
- Smallwares should be clean, sanitized, and dry before storing in a clean location.
- Individuals should receive training on the safe use of a piece of equipment before using it.

Test Prep

1. The part of a knife blade that extends into the handle is called the _____.
A. spine
B. bolster
C. tang
D. steel
2. Hold a knife blade at a ____ degree angle when using a steel and at a ____ degree angle when using a whetstone.
A. 30, 10
B. 20, 20
C. 10, 30
D. None of the above.
3. What is the term for a cone-shaped strainer?
A. China cap.
B. Colander.
C. Ricer.
D. Food mill.
4. Which of the following smallwares can be used in a steam table or ice bath?
A. Chinois.
B. Wok.
C. Sautoir.
D. Bain marie.
5. **Math.** According to a local knife shop, every time a knife is sharpened there, 0.5 millimeters (mm) of blade is removed on average. If the knife is sharpened twice a year, how long will it take for 1 centimeter (cm) of blade to have been removed? (Hint: 10 mm = 1 cm)
6. **Writing.** Prepare a document to record various equipment and safety training and assessments that you have completed. Have your instructors sign off on this record. Revise and add to it as you continue your education and training. Include as much detail as possible.
7. **Math.** Use a protractor to create a cardboard triangle with a 20-degree angle. Use the triangle as a guide to practice holding a knife at a 20-degree angle to either a steel or whetstone.
8. **Math.** You have a half-size hotel pan of sliced beef and you need to record the weight of the beef on the production sheet. The pan and beef together weigh $13\frac{1}{4}$ pounds. The tare weight of the pan is $\frac{3}{4}$ pound. The scale does not allow you to reset the scale for tare weight. How much does the beef weigh?
9. **Writing.** Obtain permission to tour the school kitchen or another commercial kitchen. Create a list noting all the equipment a new employee should be trained on before operating. Next to each piece of equipment on the list, give your reason for including it.

Core Skills

5. **Math.** According to a local knife shop, every time a knife is sharpened there, 0.5 millimeters (mm) of blade is removed on average. If the knife is sharpened twice a year, how long will it take for

10. **Speaking.** Choose a pot or pan from your home or school kitchen. Prepare and give an informative speech identifying the materials used to make the cookware, the strengths or weaknesses in the design and construction, and the gauge of metal used if applicable.
11. **Writing.** Research to learn what materials other than metal cultures have used to construct cooking vessels. For instance, some cultures have been known to use baskets or stones as cooking vessels. Write a one-page paper about the culture and why this material was chosen for cooking. Do you think the cookware influenced the culture's cuisine?
12. **Speaking.** Imagine you are a sales representative for a company that sells knives and hand tools for use in professional kitchens. Select one of the knives or hand tools discussed in this chapter and prepare a sales demonstration. Assume your audience consists of foodservice professionals. Adjust the style of delivery, vocabulary, use of visual aids, and length of presentation based on your audience. Video your presentation and show it in class.
13. **CTE Career Readiness Practice.** Different types of thermometers may be better suited to various uses. Consider all the aspects of foodservice that require measurement of temperature such as receiving, storing, and cooking food. Draw conclusions about which type of thermometer discussed in this chapter might be best suited for different activities in the kitchen. Give examples to support your conclusions and share them with the class.

Critical Thinking

14. **Consider.** You observe a culinary student cutting a loaf of fresh bread with a chef's knife. What is your instruction to the student?
15. **Determine.** Which knives do you consider essential and which are supplemental? Provide a rationale for your answer.
16. **Analyze.** Bimetallic-coil thermometers have about a two-inch space between the end of

the thermometer and a small dimple on the stem. The thermometer must be inserted up to the dimple into the food for the reading to be accurate. Thermocouple thermometers register the temperature at the tip of the thermometer. Why do you think that many chefs prefer to use a thermocouple thermometer instead of a bimetallic-coil thermometer?

17. **Evaluate.** If you had to set up a kitchen and could choose only four pots and pans, which ones would you choose? Why?
18. **Recognize.** What factors should be considered when selecting a tool, pot, or pan for a particular task?
19. **Identify.** Why would it be a problem if a thermometer only reads the external surface of food?

Culinary Skills Lab

Identify a knife in your knife kit or kitchen with a dull blade. Gather a whetstone, lubricant, and steel. Use the whetstone and steel to sharpen the knife. Have your instructor evaluate your technique for both whetstone and steel as well as the quality of the edge on the finished blade(s).



Chef's E-portfolio

Record of Safety Training and Assessments

Upload the record of safety training and assessments you created in activity #6. Add to this record as your education, training, and career progress. Ask your instructor where to save your file. This could be on the school's network or a flash drive of your own. Name your portfolio document *FirstnameLastname_Portfolio Ch#.docx* (i.e., JohnSmith_PortfolioCh03.docx).

