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KNIVES AND CUTTING TOOLS

The importance of knives to a professional chef or cook cannot be overstated. High-quality, well-made, well-maintained knives are fundamental kitchen tools that form the foundation of a professional's work.

The "perfect" knife depends upon a variety of factors. The knife should fit your hand, feel substantial but not heavy, and should be well balanced. In the last decade or so, traditional Western-style knives, long the standard of highest quality in knives, have been joined by a number of Eastern-style knives. Both knife-making traditions have resulted in a wide array of knives, some of which can be used for a variety of cutting tasks and some crafted to perform one specific function.

A true professional could get good—even great—results from a lesser-quality knife, but it is harder work. Those same tools in the hands of a novice might make work discouragingly difficult, even impossible. The best tools make it easier for the beginner to learn cutting skills properly, right from the start. It is well worth spending the time and money necessary to get a good knife and become comfortable with the skills involved in sharpening, steeling, and using knives for a variety of cutting tasks.

The chef's knife, as the most basic, all-purpose knife, shares similarities with many other knives, from paring knives to boning knives, scimitars to slicers. Even cleavers are made up of the same basic parts. The following discussion of the parts of a knife uses a chef's knife as the model of the typical knife, made up of a blade and a handle. Knowing how each of these parts can be manufactured and shaped will help you to select any knife with care.

A Brief History of Cutting Tools

Stone cutting tools unearthed by the famed archeologist Richard Leaky at the Koobi Fora site in Kenya are believed to be nearly 3 million years old. They are considered the oldest known man-made tools. Before humans learned to mine and smelt metals, knives had to be produced from found materials, primarily flint and obsidian. Flint, a stone particularly suited to taking an edge, was worked to create a thin cutting edge. Obsidian, a volcanic glass, took a better edge, held it longer, and was more durable than flint, but it was not as widely available. Although obsidian flakes are exceptionally sharp and durable, neither flint nor obsidian is a perfect knife material.

As time went by and the skills necessary to extract pure metals from the mineral deposits above and below the earth were perfected, new materials more suitable for knife blades and other cutting tools were discovered. By about 6500 B.C.E., the skills of mining and extracting soft metals such as copper, lead, and gold from ore had become more widely practiced. These metals were easy to extract from the ore in which they were found and were also soft enough to work while cold. However, these pure metals were too soft to make durable knives for cooking and hunting.

When pure metals are blended with other metals or minerals, metal alloys are created that have their own distinct properties. By about 3500 B.C.E., copper was being alloyed with tin to form the harder, more utilitarian bronze in some parts of southeastern Asia. The practice spread to Europe by about 1800 B.C.E.

Iron, which on its own is quite brittle, prone to rusting, and very hard, can be blended with other materials to make the metal soft enough to take an edge, flexible enough to prevent it from shattering and breaking, and less likely to pit, rust, or discolor. Iron smelting, the first step in producing steel, began around 2000 B.C.E., although tools made from steel were not widely available at first because early steelmaking processes were difficult and dangerous.

Early versions of steel show some of the refinements possible when iron is blended with carbon. Originally, the carbon was the ash residue left in the forge after burning the coal or wood to heat the forge. Over time, as metalsmiths learned to control the amount of carbon they added to the iron, a metal known as carbon steel was developed. Low-carbon steel (resembling modern-day wrought iron) was first developed in the Middle East circa 1000 B.C.E., but it was not until 700 B.C.E. that steel tools became

common throughout Europe, Asia, and North Africa. Made mostly in small forges and for the purpose of weaponry, the design and production of knives stayed much the same until cutlery for the purpose of dining began to appear in the homes of the nobility. By the sixteenth century C.E., knives, as well as spoons and forks, were established parts of European culture.

Although there was still a great deal more to learn about creating a metal that was durable, flexible, and able to take and hold a sharp edge, these preliminary advances in metal manufacture and the production of tools and knives paved the way for the development of cutting tools similar in nearly all respects to the fine tools used by professional chefs and home cooks today.

Gradual improvements in furnaces allowed metalsmiths to better control the amount of the carbon added to steel. Near the end of the nineteenth century C.E., several rapid advances in steel manufacturing led to the large-scale production of carbon steel of consistent quality. As carbon steel became widely available and affordable, knives made from this material became the norm. This remained the case until the early 1900s, since carbon steel's specific advantages make it well suited to kitchen work. It is durable and hard enough to take an edge but soft enough to allow for reshaping the edge with steels or sharpening stones. If the metal is carefully tempered, it can be made flexible enough for most kitchen work.

Despite all its clear advantages over other materials used to make kitchen knives, there are still some disadvantages to carbon steel. Although it takes a good edge with little effort, the edge deteriorates relatively quickly. This means carbon knives require more upkeep. Carbon steel also rusts, pits, and becomes stained in contact with water and high-acid foods. These knives require careful cleaning and drying before storage, even for a short period.

In 1912, it was discovered that adding chromium to carbon steel inhibits rusting and staining. This metal is called stainless steel. However, stainless steel is harder than carbon steel, making it more difficult for kitchen workers to keep the blade's edge in good shape. Although some specialty knives and many surgical instruments are still made from stainless steel, it wasn't until the development of high-carbon stainless steel around 1920 that carbon steel was replaced as the metal of choice for kitchen blades.

High-carbon stainless steel is produced by blending iron, carbon, chromium, and other metals, such as molybdenum, in a specific ratio to form a blade that is stain-

less, resilient, and capable of receiving and holding a sharp edge. Although other blade materials, such as stainless-steel alloys (the so-called super stainless steel) and ceramic blades, have since been discovered, high-carbon stainless steel is still used to make the majority of professional-quality knives today.

Damascus Steel

Damascus steel, which has streaks and ripples of carbon across the face of the blade, is becoming popular in both Western and Eastern knives. Named for Damascus, the capital of Syria, and popularized by the Islamic armies of the second crusade (twelfth century C.E.), the technique was originally developed and perfected in India, where the metal was called *wootz*. The steel has an extremely high carbon content (nearing 2 percent carbon). Steel, iron, and carbon are placed within a ceramic container known as a crucible, and then exposed to extremely high heat. The excess carbon bonds with other substances in the metals and precipitates to the surface, where it creates the metal's unique rippled pattern. Today's Damascus steel blades may be made by a different, modern method in which soft- and hard-carbon steels are folded together, then treated with acid. The acid eats through the metals at different rates, creating similar streaks.

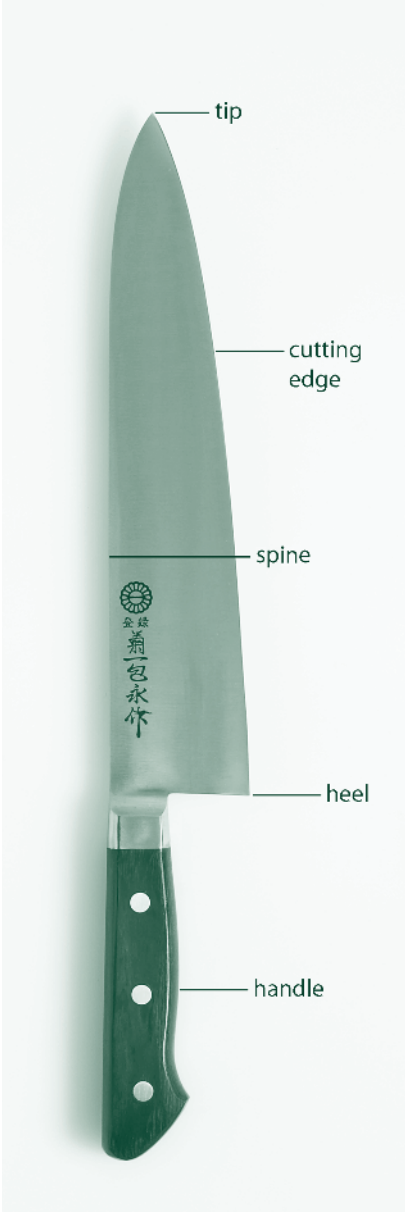
The Parts of a Knife

A knife is constructed from several parts, each of which plays a role in the utility, balance, and longevity of the whole. Newer materials have replaced some traditional ones; bone handles are not ordinarily found on kitchen knives today, for example, but composition materials are increasingly common. This section describes the function of each part of the knife and how the parts are put together to form a high-quality tool.

The Blade

Metal knife blades are either forged or stamped.

Forged blades are made by heating a rod (also referred to as a bar or ingot) of high-carbon stainless steel to around 1700°F. The heated metal is set on a handle and then struck with a hammer to pound it to the correct shape and thickness. One



Anatomy of a chef's knife.

of the advantages of a forged blade is that its thickness tapers from the spine to the edge and from the heel to the tip, which gives it the correct balance. After the blade is shaped, it is tempered by heating the blade and then cooling it to improve its strength and durability. Forged blades are generally more durable, better balanced, and of good quality. They tend to be more expensive than stamped blades, however.

Stamped blades are made by rolling the steel into sheets and then cutting out blade-shaped pieces. These blades are of a uniform thickness and may be lighter than some forged blades. Today's stamped blade knives are better balanced than their predecessors, and improved techniques for tempering the metal has also improved their durability and quality.

Japanese sword makers developed techniques to forge and temper the metal distinctly different from those used by Western smiths. First, steel is beaten into sheets and folded repeatedly, and, finally, the metal is slowly tempered in warm water. This refolding and slow tempering make the steel stronger and harder than Western forms of carbon steel.

After the blade is shaped by either forging or stamping, the edge is created. Several types of edges can be used to create a knife, depending upon the intended use.

Taper-Ground Edge The sides of the blade taper smoothly from the blade's thickest point, at the spine, to a narrow V-shaped edge. The angle of the V can be gentle or extremely severe, almost wedge-like. Taper-ground blades are well suited to general-purpose knives and those used for heavy cutting and chopping work since they keep the blade quite stable.

Hollow-Ground Edge The sides of the blade near the edge are ground away to form a hollow, giving the blade an extremely sharp edge. The greater the arc of the hollow, the sharper the edge. Hollow-ground blades are well suited to carving and slicing tasks.

Serrated or Sawtooth Edge The edge is shaped into a row of teeth that can be set very closely or more widely apart. Teeth that can bite make this a good edge for slicing foods with a crust or a firm skin, such as bread, tomatoes, and melons.

Scalloped Edge The edge is ground into a series of small arcs, making it easier to grip and cut into foods. Scalloped blades are used for slicing many of the same foods as serrated blades.

Granton Edge This edge is made by grinding ovals into the sides of the blade, alternating the position on either side of the blade. This makes it less likely that moist cooked meats and fish, especially smoked salmon or gravlax, will stick to the blade.

Single-Sided Edge This style of blade is found most often in Eastern-style knives. Rather than both sides being ground down, only one side is ground, creating a wedge-shaped cutting edge. The angle created by the single edge is more extreme, which means that while the knife is sharper, its edge is more fragile.

The Bolster

In some knives there is a collar or shank, known as a bolster, at the point where the blade meets the handle. The bolster gives the blade greater stability and strength, making it easier and safer to chop through bones, shells, and other hard objects. Some chefs prefer knives with bolsters and consider them to be a sign of a well-made knife that will hold up for a long time. Some knives may have a collar that looks like a bolster but is actually a separate piece attached to the handle. These knives tend to come apart easily and should be avoided. Asian-style knives do not typically have a bolster; however, this is not necessarily a sign of poor craftsmanship.

The Tang

The tang is actually a part of the blade itself. It is the point at which the handle is attached to the knife. Tangs may be full, partial, or rat-tail.

Full Tang A full tang extends the entire length of the handle, giving the knife a greater heft in the handle. Knives with a full tang are sturdy, well balanced, and long-lasting. Full tangs are essential for heavy work; chef's knives or cleavers should have a full tang.

Partial Tang A partial tang does not run the full length of the handle. Although blades with partial tangs are not as durable as those with full tangs, they are acceptable for less frequently used knives or those used for lighter work, such as bread knives, paring or utility knives, and some slicers.

Rat-Tail Tang Rat-tail tangs are much thinner than the spine of the blade and are encased in the handle, which means that they are not visible at the top or bottom edges. The tang is heated and then inserted into the handle. As it burns its way into the handle material, it creates a strong, secure bond between the knife and the handle. Rat-tail tangs were once considered a sign of an inferior knife that would not hold up to heavy use; it is true that this style of knife manufacture was less expensive and was once a sign of a cheaper knife. However, this is not automatically true in all cases. In fact, certain high-quality Japanese-style knives with wooden handles often feature a rat-tail tang.

The Handle

Knife handles are made of various materials, including hard woods with very tight grain, such as walnut or rosewood (often impregnated with plastic), as well as textured metal, and composition materials (vinyl). Some are cushioned to make long hours of work less fatiguing.

Wooden handles are attached to the blade with rivets. If rivets are visible on the handle (they are not always), they should lie flush with the surface of the handle to prevent irritation to the hand and to avoid creating pockets where microorganisms could gather. Composition handles are molded onto the tang.

You will hold your knife for extended periods, so be sure the material and the shape of the handle feel comfortable in your hand. Many manufacturers produce several lines of knives so they can offer a range of handle sizes. People with very small or very large hands should be sure that they are not straining their grip to hold the handle. Western-style knife handles are normally meant for use by either right- or left-handed individuals. The handles on Eastern-style knives are more likely to be produced with specific handedness in mind.

LEFT TO RIGHT Serrated slicer, *sujihiki* (slicer), two utility knives (the first one with granton edge), paring knife, two chef's knives, *yo-deba, gyuto*.

Types of Knives

As you learn to work in a professional kitchen, you will want to have the correct tools for certain tasks, but that does not mean that you need to acquire every knife under the sun in order to do most kitchen tasks efficiently. You should decide to purchase a special knife only after evaluating whether your work requires it.

The list that follows is intended as a guide to the knives that may be found in nearly any well-outfitted knife kit. As you continue to learn more about cutting and cooking, you may want or need to acquire some highly specialized knives and cutting tools, such as those used almost exclusively in the bakeshop or butcher shop.

General-Purpose Knives

General-purpose knives can perform more than one function. Paring knives are considered general purpose because you can use them to trim or peel vegetables, and for a variety of cutting, chopping, mincing, and slicing tasks. As more and more Eastern-style knives are finding their way into knife kits and kitchens around the world, we've expanded our list here to include a number of general purpose Eastern-style knives, along with the traditional Western-style general-purpose knives: the chef's knife, utility knife, and paring knife. (See photos on pages 12 and 15.)

Chef's Knife A chef's knife (also known as a French knife) is the most often used item in any knife kit. It is designed and manufactured for wide-ranging general use in the kitchen. The blade is shaped and worked so that it can peel and trim, slice, chop, mince, fillet fish, and fabricate meats and poultry. In the hands of a skilled professional, this knife can be used to perform the tasks of many special-purpose knives.

The blade of a chef's knife typically ranges from 8 to 12 inches in length and is about 1½ to 2 inches wide at the heel or bolster, tapering to a point at the tip. When viewed from above, the spine should also appear to taper from its thickest point, at the bolster, toward the tip.

One sign of quality in a knife is the balance between the blade and the handle. Most good chef's knives are equally balanced, with the weight of the blade equal to the weight of the handle. Some knives have heavier blades than handles to give them additional weight and force for heavy-duty tasks like chopping through bones or heavy

rinds. Some knives have most of the weight in the handle; this is typically true of knives used for fine work, for instance, a filleting knive or a paring knife.

The handle and the blade should join in such a way that you can chop foods on a cutting board without bashing your knuckles into the cutting surface. If possible, use a chef's knife to cut something before you buy it to determine which style of knife feels best and gives the best results.

The blade of the chef's knife has several distinct work areas: the tip, the cutting edge, the heel, the spine, and the flat of the blade.

The tip is used for fine work such as paring, trimming, and peeling. It can also be used to core fruits and vegetables or to score items so that they will marinate or cook more evenly.

The cutting edge is used for slicing tasks, such as cutting fish fillets into portions or carving cooked foods into slices. Cutting foods into neat dice, julienne, paysanne, and other precision cuts is easiest when you let the middle portion of the blade's long, sharp, cutting edge do the work.

The heel area of the blade is best suited to cutting tasks that require some force because the blade is the widest and the thickest at that point. The bolster is located at the heel of the blade, just where the handle and blade meet. The added heft provides the greatest possible concentration of weight and force at that spot in the blade. This permits you to chop through tendons and joints using a quick, sharp motion, or to slice through a winter squash's tough rind.

Even the parts of the blade without an edge have applications in the kitchen. The spine can be used to lightly score foods before pounding or butterflying them, or to crack lobster claws. The flat side of the blade can be used to crush garlic or to lift foods up from the cutting surface.

OPPOSITE, CLOCKWISE FROM TOP LEFT Three Asian-style cleavers (Chinese, *usuba, daido*), *yo-deba,* bird's beak (tourné), paring knife, clam knife, pizza wheel, pastry wheel, cheese-cutting tools (heart-shaped blade, bell-shape, serving fork, slicer), paring knife (ceramic blade), *santoku* (ceramic blade), and mezzaluna (CENTER).

Asian-Style Cleavers The Chinese-style cleaver has a blade that is rectangular in shape with a single-sided edge. The cleaver is used for a wide range of kitchen operations, including fine work such as peeling, trimming, and mincing, and for more demanding tasks including disjointing poultry or filleting fish. In addition to its usefulness as a knife, this style of cleaver can be used to tenderize meats by "chopping" them with the spine of the blade, to pound foods by flattening them with the broad side of the blade, and to transfer foods from the cutting board by using the blade as a bench scraper. For many Asian-trained chefs, and a growing number of Western-schooled chefs, this style of cleaver is the most important general-purpose knife they have in their kitchen or personal kit.

Gyuto (gi-yu-to) The *gyuto* is similar to a chef's knife. They can be slightly thinner than the average chef's knife and have Asian-style handles. This style of knife is not a traditional shape for Japanese knife makers; it is a double-edged knife and is rarely, if ever, available single-edged. It is used just as a chef's knife would be used.

Santoku (san-toe-koo) *Santoku* translates literally as "three virtues," according to Korin's *The Japanese Chef Knife Collection*. The name is derived from the practice of using this knife to cut meat, chicken, or pork (normally a specialty knife would be used for each item). This is a new multipurpose knife in the Japanese market, and has become extremely popular across the world. The shape is similar to a chef's knife, but the blade is shorter, as though the chef's knife had been compressed.

Utility Knife This smaller version of a chef's knife is used for light cutting, slicing, and peeling chores. The blade is generally 5 to 7 inches long. Not only is the blade shorter than that of a chef's knife, it is also thinner and lighter, making it useful for slicing smaller items such as tomatoes.

Usuba (oo-su-bah), Kamagata Usuba (kah-mah-gah-tah oo-su-bah), and Nakiri (nah-kee-ree) These three knives, made in Japan, are used for chopping vegetables. All three feature long, thin, narrow blades perfect for slicing, trimming, and chopping a variety of vegetables.

The traditional shape of the *usuba* and *nakiri* reflects the knife-making style known as *Kanto* that is favored by knife makers in Tokyo. These two knives have a long rectangular shape, like a longer, narrower cleaver. The difference between the two is that the *usuba* has a single-edged blade while the *nakiri* is double-edged.

The *kamagata usuba* is made in a style called *Kansai* that is preferred by knife makers in Osaka. The blade curves in from the spine to the tip and is single-edged.

Paring Knife Paring knives are the second most often used knife. This knife, used primarily for paring and trimming vegetables and fruits, has a 2- to 4-inch blade. Some blades taper to a point, much like a chef's knife; others have a curve or bend at the tip, sometimes referred to as a Granny knife. This knife is a frequently used item that you should take as much time to select as you do to choose your chef's knife.

A tourné knife is similar in size to a paring knife, but the blade is curved to make cutting the rounded surfaces of tournéed vegetables easier. The inverted curve of the blade gives this knife its second name, bird's beak.

Slicers Slicers have long, thin, narrow blades in order to make smooth slices in a single stroke. The type of edge on the blade is selected to make a particular food easier to slice. Some blades are quite flexible and others are rigid, depending upon the food they are used to slice. The tip of the slicer can be pointed or rounded.

Meat slicers are typically 15 to 18 inches long or longer, with taper ground or hollow-ground edges and relatively rigid blades. Salmon slicers, used for smoked salmon or gravlax, are even thinner than meat slicers and often have a granton edge to keep the moist, delicate flesh from sticking and tearing as it is sliced. These slicers generally have flexible blades. Slicers used for tomatoes, breads, or pastries are often serrated, scalloped, or saw-toothed.

LEFT TO RIGHT *Yo-deba* (butchering), *yanagi* (sushi and slicing), Western-style filleting knife (flexible blade), *sujihiki* (slicing and carving), *honesuki* (poultry butchering), scimitar (butchering), *hankotsu* (boning), and Western-style boning knife (rigid blade).

Knives for Butchering and Fabricating

Preparing meats, poultry, and fish in the professional kitchen calls for more specialized knives than the general-purpose knives just introduced. Their distinctive blade shapes make them easy to distinguish from a general-purpose knife. Their blades may be thin, narrow, flexible, or have some other unique characteristic, such as the pronounced curve of a scimitar, that sets them apart and improves their ability to perform one specific function. At minimum, most chefs have a boning knife and a filleting knife. If you are planning to do a lot of butchering, you may also need a scimitar and a butcher's cleaver.

Boning Knife A boning knife is used to separate raw meat from the bone. The blade—about 6 inches long—is thinner and shorter than the blade of a typical chef's knife and is usually rigid. Some boning knives have an upward curve; others are straight. The blade is narrower than a chef's knife blade to make it easier to work around bones, between muscle groups, and under gristle and the tough, shiny membrane called silverskin. Even if you use your boning knife less frequently than your chef's knife, you should still look for a high-quality boning knife with good stability and durability.

Filleting Knife Chef's knives and boning knives can be used to fillet fish, but these larger and more rigid blades often leave behind the flesh closest to the bone. Filleting knives are specifically designed for filleting fish. This knife is similar in shape and size to a boning knife, but has a more flexible blade. This permits you to separate the delicate flesh of a fish from the bones easily, with little loss of edible fish.

Deba, Yo-Deba (day-bah, yo-de-bah) The *deba* and *yo-deba* are butchering knives, used for breaking down both meats and fish. The *deba* has a single-edged blade, while the *yo-deba* has a Western-style double-edged blade. The blade shape is reminiscent of a chef's knife, but is much thicker. The weight and thickness of the blade make it ideal for chopping through bones and slicing through joints of meat and poultry.

The knife performs well when filleting fish for sashimi, but you may not get as high a yield as you would using a filleting knife. When preparing fish for sushi, the cleanness of the cut is most important, and the fish is usually further trimmed after it has been filleted—so yield is not necessarily as much of a concern.

Butcher's Cleavers Cleavers have a rectangular blade (the edge may be curved or straight, depending upon intended use). The blade is typically double-edged and is quite hefty, since it must cut through bones, joints, and tendons. The cleaver is used for very heavy cutting tasks in the butcher shop. Once those cuts are made, the chef switches to either a scimitar or a boning knife to slice through the meat.

Scimitar The long, curved blade of a scimitar makes it well suited to the slicing action required to cut through large cuts of raw meat when portioning them into steaks, cutlets, or medallions. The blade can range in length from 12 to 16 inches.

BELOW, CLOCKWISE FROM LEFT Fish scaler, lobster cracker, scissors (shears) and string, meat mallet (tenderizer), meat pounder (for cutlets, etc.), straight trussing needed, angled trussing needle, barding needle, shrimp peeler and deveiner, and tweezers.

Clam and Oyster Knives Clam knives have a 3- to 4-inch-long blade with a rounded tip and a handle. Oyster knives have a short, pointed blade with a guard at the point where the handle meets the blade. The different shapes represent the different ways that these two mollusks are opened. To open a clam, slip the edge of the blade between the shells on the edge opposite the hinge. To open an oyster, press the pointed tip of the blade into the hinge. Once the knife has penetrated the shell, the blade is twisted to release the shells.

Follow these safety precautions when using shellfish knives:

- **Wear a mesh glove to avoid puncturing your hand with the knife blade.**
- **Keep a watch for shells that splinter; bits of shell can lodge in the meat.**
- **Wear goggles to protect your eyes.**

Specialty Knives

Over time, special knives have been designed to handle special cutting tasks. Cheese knives and tools with circular blades, such as pizza or dough cutters, all fill a special cutting need.

Cheese Knives There are a variety of cheese knives, each designed specifically for a particular type of cheese.

Hard cheese knives generally have a flat cutting surface and textured or etched sides on the blade to slice against the cheese evenly while preventing the cheese from sticking to the sides. Some knives have holes to make it easier to slice soft or crumbly cheeses.

Parmesean knives are specially designed to break up Parmesan or similar hard grating cheeses. Shaped like a heart, the blade tapers to a sharp point that can pierce the rind and the hard, dry cheese. To remove chunks of cheese, sink the blade into the cheese, driving it about ½ to 1 inch into the cheese, and then, with a twist of your wrist, you can pry off a piece.

Blue-cheese knives have 6-inch-long blades shaped like a bell to cut and spread any soft or crumbly cheese. Some general-purpose cheese slicers have a granton edge, while the blades of other cheese slicers may have holes, so the cheese won't

stick or rip, or they may have a serrated edge. You may also find cheese slicers that have a pronged tip, to make it easier to transfer the cheese to a plate after you cut it.

Double-handled knives allow you to put your weight into the cut. These knives are ideal for breaking down larger blocks of hard cheeses. The blades can reach up to 13 inches in length.

Dough Cutters (Pizza Cutters) This style of cutter can be used to cut pizza, of course, but it is also valuable for cutting a variety of pastries and doughs. It can make long, even cuts with no ragged edges. A circular blade is mounted on an axle. As you push the cutter over the item you want to cut, the blade turns, like a wheel. Smaller cutters are used to cut pastry doughs. Some cutters have fluted edges; ravioli cutters are an example. Specially produced dough cutters, such as a croissant cutter, can cut many smaller pieces from a large sheet of dough at one time.

Mezzaluna The name *mezzaluna,* or half moon, reflects the crescent shape of the blade. Both ends of the blade are joined to a handle. Some versions have two blades parallel to each other. To use a mezzaluna, rock the blade back and forth over whatever you are cutting (typically fresh herbs, garlic, or greens) to chop or mince them as coarse or fine as you need them to be.

Although a mezzaluna can be used on a flat surface such as a typical cutting board, it is traditionally paired with either a cutting board that has a concave area or a wooden bowl to make the most of the curved cutting surface.

Sharpening and Honing Tools

No knife kit can be considered complete without sharpening and honing tools, because the key to the proper and efficient use of any knife is making sure that it stays sharp. (Instructions for sharpening and honing knives can be found on pages 42–49.) Knife blades are given an edge on a sharpening stone and maintained between sharpenings by honing with a steel.

TOP ROW, LEFT TO RIGHT Flat steel with a ribbed surface, oval flat steel, round steel, diamond steel, ceramic steel, Arkansas triple-mount stone, Carborundum stone set in a wood base, Carborundum stone; BOTTOM ROW ceramic stone (right), water stone (left).

Whetstones

A whetstone is a block of hard material, synthetic or natural, that is used to whet, or grind and sharpen, a blade.

Stones are available in a variety of sizes, textures, and materials. Sharpening stones are produced from such man-made and natural materials as Carborundum, silicon carbide, aluminum oxide, ceramic, whetstone, industrial diamond, and naturally occurring sandstone or Arkansas stone—a hard stone quarried from the Ozark Mountains.

The relative coarseness or fineness of the stone's material is referred to as its grit. A coarse grit grinds away more of the blade, useful when knives are very dull or when they have notches. A very fine grit means that the stone will remove less of the blade itself but will result in a smoother, sharper edge.

Large stones—some with several sides and a reservoir for lubricating oil—have the advantage of accommodating large and heavy blades. Smaller stones may be a bit difficult to use on longer knives but are much easier to transport.

All stones need some sort of lubrication as you work your knife. The type of lubrication you choose depends on the stone and your personal preference. Regardless of the type of lubricant you choose, stones do wear over time, developing a concave or hollowed surface. "Stone fixers," or flattening stones, can be scraped against the sharpening surface to smooth and even out the face of the stone.

Sharpening stones fall into four basic categories: water stones, oil stones, ceramic stones, and diamond stones.

Water Stones

Water stones are composed of a compressed, granular material that soaks up water like a sponge. They are meant to be soaked in water for at least 10 minutes before you sharpen your knife. This softens the stone and allows it to form a paste as you work your knife's edge across the surface, flushing out the old grit and exposing clean grit. Water stones are available with either a single-size grit or as a combination stone.

The advantage of using a water stone is that the grit is often much finer than on other stones, so you can get a good edge on your knife more quickly than with other stones.

One disadvantage is that water stones wear down more quickly than other stones. The stone can be flattened again by rubbing two stones together until the surfaces are flat, or by using a lapping tool that can scrape away the upper surface and uncover clean grit.

Oil Stones

Oil stones are made from either natural or synthetic materials. An Arkansas stone and flint are natural stones. Man-made oil stones are most commonly made of aluminum oxide (sometimes known as India stones) or silicon carbide.

The hardness of a natural stone correlates to grit in a synthetic stone. Soft Arkansas stones act like coarse-grit synthetic stones and hard Arkansas stones are equivalent to fine-grit synthetic stones. Hard Arkansas stones are made from a novaculite, a black or white stone that is almost pure silica. Translucent Arkansas stones are the hardest and are used for finishing the edge, in the same way that a fine-grit synthetic stone is employed to refine your knife's edge.

An individual stone consists of a single hardness. To make sharpening your knives on Arkansas stones more efficient, you may prefer to use a triple-mounted holder for three different stones and three different hardnesses.

Choose a food-grade oil to use on your stone, but you should not use cooking or eating oils on your stone because those oils will turn rancid. Mineral oil is a good common choice. Apply a thin coating of the oil to the stone before you sharpen your knife. You can also use water as the lubricant for an oil stone (but remember to never put oil on a water stone).

Ceramic Stone

Ceramic stones are a type of manufactured stone. They are extremely hard and, unlike water stones, require only a light film of water when you sharpen your knife. Some people simply spray or mist the stone as they work. Ceramic stones have another advantage over water stones—they are far less messy.

Ceramic stones are available in a variety of grits. They are more expensive and only have a single-size grit per stone. They work as quickly as a water stone but wear down even more slowly than oil stones. A good ceramic stone could last a lifetime.

Diamond Stones

These stones are, in fact, plates of steel with diamond crystals embedded in the surface. Different sizes and amounts of crystals determine the grit. These stones sharpen knife edges quickly and although they don't wear as other stones do, the crystals smooth out and get dull over time. The biggest disadvantage of diamond stones is their cost.

Steels

Steels, like sharpening stones, are available in coarse, medium, and fine grits. They may be round, oval, or flat. The length of the steel's working surface can range from 3 inches for a pocket version to over 14 inches. The easiest and safest length for a steel is at least 2 to 3 inches longer than the blade of your chef's knife.

Hard steel is the traditional material for steels. Other materials such as glass, ceramic, and diamond-impregnated surfaces are also available. Those made of metal are magnetic, which helps the blade retain proper alignment and also collects metal shavings. Ceramic and diamond-impregnated steels are not magnetic.

A guard or hilt between the steel and the handle protects the user, and a ring on the bottom of the handle can be used to hang the steel.

Electric Knife Sharpeners

Most electric sharpeners use a rapidly rotating abrasive surface that wears away the knife's damaged edge to form a new, sharper edge. The abrasive surface can be a belt, wheel, or series of disks.

Because they operate at high speeds, there is a danger of over-sharpening the blade. Even a short time in an electric sharpener can grind away too much of the blade, causing excessive wear and significantly shorten the knife's useful life.

If your kitchen has an electric knife sharpener, be sure to get clear instructions on how to use the sharpener for the best possible results and the least damage to your knife.

Additional Hand Tools

A number of cutting tools are used in the kitchen. Some of these tools make large-volume work easier, faster, and more efficient. Others are used to perform very specific cutting tasks. The tools covered in this section are used to slice, dice, cut, shred, or grate foods, as well as to trim or manipulate foods as they cook.

Ice-Carving Tools

Large and small ice carvings are used for both display and individual service. Carvers today sculpt mirror images into the ice, pack it with snow, and create a white-on-clear display that looks almost like a holograph. Less-demanding displays are easy to make from a split block of ice that sandwiches a logo.

FROM TOP V-shaped chisel, handsaw, half-moon chisel, chain saw; FROM LEFT sander, power drills (showing two different heads), flat chisel, and chipper.

TOP ROW Nested ring biscuit cutters, spider, spaetzle maker; CENTER ROW dough docker, garlic press, cherry or olive pitter, microplane, ripple-cut slicer; BOTTOM ROW citrus reamer, paddle for spaetzle, and egg slicer.

Tongs and Similar Tools

Chefs use tongs the way they might use their thumb and forefinger: to grip something firmly enough to lift or turn it. Other tools similar in basic function that you might find in a chef's personal tool kit include some less-obvious options: tweezers or forceps, pliers, and specialized tools for cracking nuts or lobster shells.

Tongs Tongs are available in a variety of sizes. The two sides of the tongs are joined at one end with a hinge. A spring keeps the tongs open and provides resistance as you clamp them together. Some have a locking mechanism that holds the tongs closed until the lock is released. The gripping end may be rounded with a scalloped edge. In addition to their obvious use to lift and turn foods in a pan, deep-fat fryer, or on the grill, chefs often use tongs instead of their bare fingers to test the doneness of a food. By pressing the tongs against the food, they can feel how soft or firm the food is.

Tweezers and Forceps Tweezers and forceps are very useful in the kitchen for removing small bones from fish or removing foods from jars with long or narrow necks. Forceps look like scissors but they lock into place, so you don't have to worry about losing your hold on something as you move it. Tweezers are small enough to use for very fine or delicate work. Anyone responsible for displaying foods attractively, whether a banquet or garde manger chef or a food stylist, typically has a number of different tweezers of all different sizes and shapes.

Pliers, nut crackers, and seafood crackers are used for heavier tasks that require a bit of force, such as crushing a shell so that the edible portion can be picked out. Needle-nose pliers are often used to remove bones from fish—especially the pin bones found in salmon fillets.

Scissors and Shears

Scissors are part of any kitchen's equipment. They are used to cut parchment paper, open packaging, cut grapes into clusters, trim and mince herbs, and cut string. They are also useful to cut through small bones and shells. (See photo on page 20.)

Shears are larger, sturdier scissors, used to cut through heavier items. Poultry shears can cut through the tight joints and ligaments of chickens, ducks, and geese. Shears may have a textured edge on the blades. Poultry shears come apart at the joint for easy cleaning and sharpening. In the kitchen, it is important to use shears stamped with the National Safety Foundation's (NSF) mark.

Spatulas

The term *spatula* derives from the same Greek root word that gave us "sword," "spoon," and "spade." A spatula consists of a relatively broad, flat head or blade with a handle.

Some spatuas are used to turn or lift foods as they cook—for instance, pancakes or hamburgers. The blade of a spatula may be perforated or solid. (A fish spatula is a specific type of spatula with a wedge-shaped, slotted head that is smaller and more flexible than the standard "pancake" turner.) They may have an offset blade, to make it easier to reach into pans. Others have straight blades; these spatulas are similar to palette knives and sandwich spreaders.

Another type of spatula has a flexible head made of rubber or silicon that you may hear referred to as a rubber scraper. The head can be constructed from rubber, silicon, and heat-resistant materials, making them suitable for use in hot pans. Handles are often made of nonconductive materials such as plastic or wood. These spatulas are used to fold batters, spread soft foods, and scrape out the contents of pans, bowls, and containers cleanly.

Peelers

A peeler removes the outer skin of a fruit or vegetable. There are two basic kinds of peelers: a rotary peeler, with a swiveling, vertical head; and a stationary peeler, with a horizontal head. After using the blade to slice away the skin or peel, the tip is used to remove any blemishes, spots, or the eyes from fresh fruits and vegetables.

A good peeler should have two features: There should be a cutting surface on each side of the split head, allowing it to peel in both directions; and a well-constructed peeler will have a removable blade for easy cleaning and replacement.

Graters and Rasps

Graters and rasps are used to shred and grate items. Box graters have four sides with openings of different sizes and shapes on each side. The smaller the hole, the finer the end result. The finest side is used for grating and should be used with firm or hard textured foods (such as nutmeg or Parmesan cheese). The larger openings are used to shred foods with a moderately firm texture (such as Cheddar or mozzarella cheese, carrots, or zucchini). Some graters will have a slicing side, ideal for cheese or firm fruits. Some graters will have a section on one side with flower-like openings used to grating nutmeg and make citrus zest.

Nutmeg graters have a curved surface and small openings. Graters for hard cheese, such as the Mouli grater, have a drum pierced with holes that turns against the food and cuts into it.

For large-volume work, grating attachments are available for mixers, grinders, food choppers, and food processors.

Rasps, such as microplanes or nutmeg graters, are handheld graters and come in a variety of textured openings, similar to box graters. They are used for the same purposes as graters and achieve the same results.

Graters should be washed and rinsed immediately after use. To clean the grating sides, soak the grater in clean soapy water or spray with water to force out any particles of food. Running a sponge over the cutting side of the grate will simply shred the sponge and clog the openings in the grater.

Corers, Wedgers, and Pitters

Corers remove the core of a fruit without damaging the skin or integrity of the whole fruit. They are hollow, sharp-edged cylinders attached to a short handle. To use them, position the open end of the corer over the core. Push the corer into the fruit, twisting it as you push. Once you've pushed the corer completely through the fruit, pull it back out, removing the core.

An apple wedger is used to core and cut an apple into even slices, all at the same time. It is a metal ring, with handles on opposite sides, and it contains a series of sharp-edged slats that connect to a smaller, inner circle. The design resembles a bicycle wheel but with fewer spokes.

Olive and cherry pitters have a small rod that you push into the food to force the pit out. One common pitter design resembles pliers, with a rounded bowl at one side to hold the cherry or olive and the rod on the other side. When you squeeze the pitter, the rod plunges into the food and pushes the pit out. Another pitter design available resembles the plunger end of a hypodermic needle, with a spring-loaded mechanism that you push down with your thumb to force the pit out.

Zesters and Channel Knives

Zesters remove the flavorful, colored peel of citrus fruit without cutting into the white, bitter pith. The head resembles a small metal hand with small, sharp-edged rings in place of fingers. The zester cuts away thin strips from a food, generally fruit or vegetables, as it is scraped along the surface.

Channel knives are used to score the skin or rind of vegetables or fruit and for other decorative cuts. You can use a channel knife to cut long strips from oranges or lemons. The cutting surface is a small indentation at the edge of a teardrop-shaped metal head.

Mandolines and Benriners

Mandolines and benriners create slices, bâtons, juliennes, and gauffrettes (or waffle cuts). They are most appropriate when you need to produce a large volume because they are quick, efficient, and consistent.

The French-style mandoline is made of nickel-plated stainless steel with blades of high-carbon steel. Levers adjust the blades to achieve the cut and thickness desired. There is a carriage device that holds the food and a hand guard that permits you to press the food firmly against the blade without fear of cutting yourself. There are folding legs that can be adjusted and locked into place before working to make cutting easier and safer. The legs are folded beneath the device for storage.

The ideal mandoline's blades are adjustable. By adjusting a lever on the back of the mandoline, you can lock different blades into place. Some have inserts to produce a variety of specialty cuts, including fluted slices, wavy or crinkle-cut sticks, or gauffrettes.

Cleaning and maintaining the device is as simple as rinsing it with running warm or hot water and scrubbing with soap, if necessary, to remove food particles. Be careful of the cutting surfaces and inserts, as they are extremely sharp. Dry the device by hand or allow it to air-dry; its stainless-steel construction is rust-proof. Because of the moving parts, it might be necessary to lubricate joints occasionally. Apply the lubricant carefully, keeping it away from the cutting surface, where it would come into contact with food.

A tool similar to the mandoline, known as a Japanese-style mandoline or benriner, is also widely used in both professional and home kitchens. The blade is made of stainless steel, but the rest of the cutter is made of plastic, making it less expensive than the traditional mandoline. The main blade should be adjustable, and it can have interchangeable blades as well.

Ripple Cutters

Special cutters or blades are required to produce ripple cuts. Hand tools and slicers are available for this purpose. The ripple-cut blade on a mandoline is used to cut cucumbers, carrots, potatoes, and soft-skinned squashes. Special blades are also available for use with food processors, slicers, and choppers.

Guitars (Egg Cutters)

The cutting tool known as a *guitar* got its name because the cutting wires look like the strings of a guitar. They have of a number of parallel wires set into a frame or between two handles. You cut food with a guitar either by pressing the food onto the wires, which make slices as thick as the spaces between the wires, or by pressing the guitar onto the food. Egg cutters are also a type of guitar. Some egg cutters are made in two halves, held together by a hinge. You set the food you want to cut on one side of the egg cutter, then close the cutter to slice the food. Egg cutters, despite their name, can be used to slice other relatively firm foods, such as avocados or mushrooms.

Food Mill

This kitchen tool purées soft foods while at the same time removing seeds, skin, and fibers by hand-cranking a flat, curved blade over a disk. This action both chops food and forces it out of the small holes of the strainer, giving the product a rustic, puréed texture without liquefying it like a blender or food processor might. Most professional models have interchangeable disks with holes of varying fineness. An exception is the Foley food mill, which has a mesh disk that is fitted into place. A food mill should come apart for easier cleaning. Each piece should be cleaned separately and dried; then the machine may be reassembled and stored.

Ricer

This is a device in which cooked food, often potatoes, is placed in a pierced, hinged hopper. A plate at the end of a lever pushes the food through the openings in the hopper. (Garlic presses and french-fry cutters operate on the same principle.) This achieves a roughly puréed texture, similar to a food mill. Ricers do not come apart at the hinge, so when you clean them, make sure that you remove any food particles. Dry the ricer thoroughly, especially around the hinge, before storing it.

Garlic Press

Used to crush cloves of garlic and make small quantities of garlic paste, garlic presses are similar in concept to ricers, only smaller. A pierced hopper holds the clove of garlic and a plunger is pressed against the clove, forcing it through the small openings.

Carving and Kitchen Forks

Forks are used to steady foods as they are cut, to test the doneness of braised meats, and to hold and serve slices of carved meat. Kitchen forks are long, two-pronged forks that have flat heads and long tines. Carving forks have curved heads and are more visually appealing for use in front of customers.

Parisienne Scoops

Parisienne scoops are designed to scoop out balls or ovals (depending on the shape of the scoop) from fruits and vegetables. The scoops are made in a range of sizes and may be round, oval, fluted, or smooth. Besides making attractive balls of food, these scoops can core fruits and vegetables for presentation. You can scrape the scoop down the length of a zucchini to hollow it out, stuff it, and make zucchini boats, for example.

Wire Mesh Gloves

Mesh gloves are used to protect your hands in situations where you may not have as much control over a blade, such as a mandoline, electric slicer, or a clam or oyster knife. These gloves are made of a series of linked or woven rings that resembles medieval chain mail.

Reamers

A reamer is a ridged cone with a handle that is used to juice citrus efficiently. It can be made from plastic, wood, or various other substances, but plastic is ideal because it is less likely to absorb juice, bacteria, and oils that can stain wood.

Meat Pounders and Meat Tenderizers

A pounder or tenderizer is composed of a weighted head—textured or flat, round or square—attached to a handle. Any of these metal or wood tools can be used to pound meats to make them thinner or an even thickness so that the pieces cook more quickly and evenly. Make sure the tool has an NSF logo on it; otherwise it may be unsafe to use in the kitchen. (See photo on page 20.)

Shrimp Deveiners

Shaped like a curved, elongated teardrop, the thin "nose" of a shrimp deveiner is inserted along the digestive track of a shrimp, and, with a clean jerk, removes both the vein and the shell. They are usually made of plastic, and are inexpensive and easy to clean. There are various types, and not all are made of plastic. Regardless of construction, a sturdy nose is the key; a flimsy nose can break off easily. (See photo on page 20.)

Large Cutting Tools

Large pieces of equipment with moving blades can be extremely dangerous if they are not used with understanding and respect. The importance of observing all the necessary safety precautions cannot be overemphasized. To keep large equipment functioning properly and to prevent injury or accident, you must keep the equipment properly maintained and cleaned. As these tools are essential for a number of operations, you should be able to use them with confidence.

Using Large Cutting Equipment Safely

Observe the following guidelines when working with large equipment:

1. Obtain proper instruction on the machine's safe operation. Do not be afraid to ask for extra help.
2. First turn off and then unplug electrical equipment before assembling or breaking down the equipment.
3. Use all safety features. Be sure that lids are secure, hand guards are used, and the machine is stable.
4. Clean and sanitize the equipment thoroughly after each use.
5. Be sure that all pieces of equipment are properly reassembled and left unplugged after each use.
6. Report any problems or malfunctions promptly and alert coworkers to the problem (an "out of order" sign attached to the machine itself is a good approach).

Food Processor

A food processor is a machine that houses the motor separately from the bowl, blades, and lid. Food processors can grind, purée, blend, emulsify, crush, knead, and, with special disks, slice, julienne, and shred foods.

Electric Slicer

This machine is used to slice foods to even thickness. A carrier moves the food back and forth against a circular blade, which is generally carbon steel. There

may be separate motors to operate the carrier and the blade. To avoid injury, all the safety features incorporated in a food slicer, especially the hand guard, should be used.

Meat Grinder

This is a freestanding machine or an attachment for a standing mixer. A meat grinder generally has a feed tray and a food pusher (also known as a tamper) and should have dies of varying sizes.

The foods should be cut in a size and shape that allows them to drop easily through the feed tube and into the opening only as quickly as the machine can handle them. The tamper should be used only to free foods that stick to the tray or the mouth of the feed tube; it should not be used to force foods down the feed tube.

All food contact areas should be kept scrupulously clean and well chilled. This is important not only for sanitation and wholesome food but also to produce the best possible texture in the finished dish.

Vertical Chopping Machine (VCM)

This machine operates on the same principle as a blender. A motor at the base is permanently attached to a bowl with integral blades. As a safety precaution, the hinged lid must be locked in place before the unit will operate. The VCM is used to whip, emulsify, blend, or crush foods.

Food Chopper (Buffalo Chopper)

Generally made of aluminum with a stainless-steel bowl, food choppers are available in floor and tabletop models. The food is placed in a rotating bowl that passes under a hood, where blades chop the food. Some units have hoppers or feed tubes and interchangeable disks for slicing and grating. Food choppers are sometimes called buffalo choppers because, viewed in profile, they look a little like a buffalo.