



All about Chocolate

Selecting, handling, and storing everyone's favorite ingredient

BY CAROLE BLOOM

I'm crazy about chocolate, and I know I'm not alone. I spend a good part of my professional life working with chocolate, and off-duty I certainly enjoy my share of it. I've gained a better appreciation for chocolate by learning about its cultivation, processing, and various types. And of course, knowing how to handle chocolate properly in the kitchen only adds to the pleasures of this favorite ingredient.

CHOCOLATE GROWS ON TREES

Chocolate may not seem like it comes from a plant, but its source is the fruit of the cocoa tree, *Theobroma cacao*. It's primarily cultivated in equatorial regions of the world (where the climate is warm and humid), although some chocolate is now being produced in Hawaii.

Cocoa trees that grow in the wild can reach heights of up to sixty feet. Cultivated trees, however, are raised in the shade of tall, large-leaved "mother" trees, usually banana trees, rubber trees, or coconut palms. These mother trees keep the cocoa trees from growing much more than twenty feet tall, making it easier to harvest the beans.

As many as 5,000 tiny flowers at a time will bloom on a cocoa tree; these flowers will develop in slow succession into large, deeply ridged, football-size pods that look something like large papayas. At any given time, the cocoa tree will simultaneously support flowers, unripe green pods, and ripe orange or yellow pods. Oddly, the pods will sprout not only from the branches of the tree, but all along the trunk as well. Within the ripe pods, a milky-white, pulpy membrane holds twenty to forty almond-shaped, ivory-colored cocoa beans.

Dark chocolates are complex like fine wines. And like coffee, chocolate becomes darker in color and richer in flavor with longer roasting.

When ready for harvest, the pods are cut from the trees and the beans are removed along with their membrane. The beans are placed on banana leaves or in large vats, covered with leaves, and left to ferment for a few days, while the membrane evaporates and the beans darken in color. The beans are then sun-dried for several days. After drying, they're packed into burlap sacks and shipped to factories to be processed.

There are two main botanical varieties of cocoa trees: criollo and forastero. The criollo tree is native to Ecuador and Venezuela. It produces the highest-quality beans, even though the trees are small and difficult to cultivate. Forastero trees, grown mainly in equatorial Africa and Brazil, provide about 90% of the world's harvest of cocoa beans. The forastero bean is harsher and more bitter than the criollo bean. Usually the two varieties are blended together. Capuacu (*Theo-*

broma grandiflorum), a relative of cocoa native to the Brazilian rain forest, has recently been discovered and is being cultivated in the Amazon. Capua-cu (pronounced COOP-oo-ah-sue) beans produce a rich, mellow-flavored chocolate with fruity undertones.

MAKING CHOCOLATE

After the cocoa beans arrive at a factory, they're roasted at 250° to 350°F for thirty minutes to two hours. It's during the roasting process that the fermented and dried beans begin to smell like chocolate. Each crop of beans is evaluated to determine the precise roasting time and temperature—two determining factors in the final flavor of the chocolate. Generally, the flavors are strengthened and become increasingly bitter with longer roasting times.

Once roasted, the outer husk of the cocoa bean is cracked and blown away through a process called winnowing, which leaves the bean's inner nib behind. The different varieties of beans (nibs at this stage) are blended to achieve the desired flavor. Although there are only two main varieties of cocoa trees, there are many variations of beans as a result of geographic origin and because hybrids of the two trees have evolved. Precise roasting times, roasting temperatures, and blending ratios are the trade secrets of every chocolate manufacturer. Combined, these factors are what make various brands of chocolate taste different.

The blended nibs are simultaneously ground and heated to melt their natural cocoa butter, which turns the entire mass to a liquid known as

chocolate liquor. When cooled, it's called cocoa paste. Without the addition of sugar or more cocoa butter, it is at this point plain, bitter chocolate (also known as baking chocolate), which isn't too pleasing to the palate.

Cocoa powder and cocoa butter. Separating chocolate paste's two elements, raw cocoa powder and cocoa butter, is the first step in making finished cocoa powder. Cocoa paste is pressed in large hydraulic machines to extract the cocoa butter. What's left behind are dry cocoa cakes, called press cakes. These press cakes are cooled, crushed, ground, and sifted to produce cocoa powder. If the cocoa powder is "Dutch-processed," the chocolate liquor is treated with an alkaline solution before it is pressed. This makes the finished cocoa powder darker, mellow, and more flavorful. The extracted cocoa butter is saved and cooled into slabs for finishing other chocolate products.

True chocolate. What we regard as straight "eating" chocolate is made from the chocolate liquor with the addition of more cocoa butter, sugar, vanilla, and sometimes milk solids. The chocolate is then kneaded or "conched" (pronounced KAHNCHT). The conching process is performed by a heavy roller that continuously heats, mixes, grinds, and stirs the chocolate to break down any remaining bits of cocoa butter and solids, leaving a homogenous, satiny-smooth, melt-in-the-mouth texture. Conching is one of the steps in processing that helps keep the emulsion of cocoa butter and chocolate liquor stable. The longer the chocolate is conched, the smoother the final product will be. This process, however, also weakens the choco-

Where would bakers be without cocoa powder? Its wonderfully mellow chocolate flavor is an essential ingredient in many confections, and it can easily warm up the coldest of nights when stirred into hot milk.



Photos except where noted: Matthew Kestenbaum

A choice of chocolates

The best way to select chocolate is to taste it plain. A chocolate's flavor won't change when you bake with it, so be sure you find one that tastes good right out of hand.

Some easy things to notice when choosing chocolate are the appearance and aroma. Is the chocolate evenly colored and shiny? Does it smell rich and flavorful? When you break the chocolate, does it snap firmly and cleanly? When you taste it, is it smooth, creamy, and does it melt in your mouth? The flavor itself should be generally pleasing and harmonious. The aftertaste, or finish, is also important: a good chocolate's flavor will linger in your mouth.

Generally, the European brands of chocolate are the highest quality and best tasting, although there are good American-made brands. Some of the most popular European brands—and my favorites—are Valrhôna and Cacao Barry (both from France), Callebaut (from Belgium), and Lindt and Tobler (both from Switzerland). The most popular and, I think, the best-tasting American brands are Ghirardelli and Guittard. These brands of chocolate are available at gourmet and imported food shops, cookware stores, some major supermarkets, some department stores, and through mail-order sources (see p. 45).—C.B.

late flavor, so chocolate makers must be careful to strike a balance between smooth texture and pronounced flavor. Higher-quality chocolates are usually conched for longer periods of time—in some cases, as long as seven days.

Conching alone is not enough to keep the chocolate emulsion stable. All chocolates have lecithin, a natural fat, added to them during conching. Though it constitutes only .3% to .5% of the finished product, lecithin is important because it helps keep the chocolate from becoming too hard and brittle.



Smooth, creamy milk chocolate gets its flavor from more sugar, less chocolate liquor, and added milk solids.

After conching, the chocolate is “tempered”—a process of heating, gradual cooling, and then reheating. Tempering helps give chocolate snap and gloss; it also helps prevent “chocolate bloom,” in which the cocoa butter rises to the chocolate's surface. Any additional ingredients (nuts, for example) are added at this point, and then the chocolate is molded.

THE RANGE FROM DARK TO WHITE

Bittersweet and semisweet chocolates, collectively called the dark chocolates, are made from chocolate liquor, cocoa butter, sugar, and vanilla. The difference between these two dark chocolates is that more sugar is added to the semisweet. Baking chocolate is also technically a dark chocolate, but it has no sugar and can only be used in recipes that appropriately compensate for that. *Couverture* is dark chocolate with extra cocoa butter, which gives it a high gloss. It's ideal for the thin, glossy coatings of many candies—hence its name, which means “blanket” in French. Milk chocolate has less chocolate liquor and more sugar than the dark chocolates, as well as the addition of milk solids.

White chocolate is made from cocoa butter, milk solids, sugar, and vanilla. When buying white chocolate, be aware that products called “summer coating” and “compound coating” use a vegetable fat other than cocoa butter as their base. Since these products lack cocoa butter, they don't taste like chocolate.

Using one chocolate for another. As a rule, the dark chocolates can be easily substituted for each other in recipes. Whether you use bitter-sweet or semisweet chocolate is simply a matter of personal preference. Milk chocolate and white



Chopping chocolate is easy with a heavy chef's knife and a stable wooden cutting board. Don't try to cut off big chunks; just shave off a bit at a time, putting the pressure on the heel of the knife.

Low heat and constant stirring yield smooth melted chocolate. A rubber spatula is ideal for scraping and stirring. Use a water bath to keep the heat at a minimum.



chocolate, however, can't be substituted for the dark chocolates or for each other because they have much less chocolate liquor and have the addition of milk solids. These "lighter" chocolates also have different handling characteristics: the milk solids burn easily and will form lumps when melted over excessive heat. Many novices will see lumps appear as the chocolate is melting and increase the heat, believing that the chocolate is simply not melting. This only aggravates the problem, as more heat will create more lumps. All the proportions of a recipe must be completely reworked to substitute one of the lighter chocolates for darker ones.

KEEP CHOCOLATE AWAY FROM WATER

Chocolate must be handled gently in order to preserve its glossy look and satiny texture. Because it's an emulsion, chocolate is very sensitive to added moisture. The first rule when working with chocolate is to prevent liquid from coming into contact with it unless a recipe specifically calls for it. Liquid causes melted chocolate to "seize"—it thickens and becomes the consistency of mud. This happens because the sugar particles begin to fall out of the emulsion and the chocolate can no longer remain fluid. When working with chocolate, make sure all your utensils are completely dry.

However, adding a large amount of liquid—more than 25% by volume—will not cause the chocolate to seize. When added in this quantity, the liquid actually forms a new emulsion with chocolate. This new, looser emulsion is what allows us to make rich, wonderful chocolate sauces and ganache (see *Fine Cooking* #2, pp. 64–69).

Chocolate that has seized cannot be salvaged.

Adding a few tablespoons of vegetable oil will bring the mixture back to an even consistency, but then you're no longer dealing with chocolate. It's best just to throw out the seized chocolate and start over.

The ideal environment for working with chocolate is 65°F with low humidity. If you can't help working with chocolate on damp days, try using a dehumidifier in your kitchen. An air conditioner also works wonders when working with chocolate in hot, muggy weather.

MELT CHOCOLATE GENTLY

Chocolate should be melted slowly over low heat. It should never come into direct contact with heat and should not be heated over 120° (or 115° for white chocolate). Overheating chocolate will cause it to taste burnt, to develop lumps, or to seize up. Again, the lighter chocolates, because of their added milk solids, are more sensitive to heat than the dark chocolates. The milk solids coagulate with too much heat, leaving lumps in the chocolate.

Chocolate should be chopped into very small pieces before melting, so that it melts evenly and with little heat. A chef's knife and a wooden cutting board are the best utensils for this; don't use a food processor because it will prematurely heat the chocolate.

The best way to melt chocolate is in the top of a double boiler over hot (not simmering) water. Be sure the top pan of the boiler fits snugly over the bottom, so no steam can escape and mix with the chocolate. A glass double boiler is ideal because you can see if the water in the bottom pan is overheating. Be sure to use a double boiler that's big enough to hold the chocolate and allow some room for stirring.

SOURCES FOR CHOCOLATE

The Chocolate Gallery, 56 West 22nd St., New York, NY 10010; 212/675-CAKE. *Valrhôna, Van Leer.*

Dean & DeLuca, 560 Broadway, New York, NY 10012; 800/221-7714. Catalog available, \$3. *Callebaut, Ghirardelli, Valrhôna.*

Fernclyff House, PO Box 177, Tremont City, OH 45372; 513/390-6420. Catalog available. *Guittard, Merckens, Nestlé, Van Leer.*

Harry Wils & Co., Inc., 182 Duane St., New York, NY 10013; 800/362-9688. Catalog available; checks only. *Cacao Barry, Valrhôna.*

La Cuisine, 323 Cameron St., Alexandria, VA 22314; 800/521-1176. Catalog available, \$3. *Cacao Barry, Callebaut, Valrhôna.*

Maison Glass, 111 E. 58th St., New York, NY 10022; 800/U-CALL-MG. Catalog available, \$5. *Callebaut, Valrhôna.*

Sweet Celebrations, 7009 Washington Ave. South, Edina, MN 55439; 800/328-6722. Catalog available. *Nestlé, Peters.*

Microwave ovens are also good for melting chocolate, as long as you're very careful. Using a medium power level, you'll need to stop the oven every 15 seconds and stir vigorously.

KEEP YOUR CHOCOLATE IN PRIME CONDITION

Chocolate is best stored at room temperature, wrapped in foil or brown paper. Storing chocolate in the refrigerator, in the freezer, or in plastic wrap will trap condensation. When stored in a cool, dry place, dark chocolate has an indefinite shelf life. Chocolate has a high fat content which picks up other flavors, so be careful of what other foods you store near it. Because of their milk-solid content, the lighter chocolates are best stored no longer than a year. If you're unsure of the quality of your chocolate, smell it; if it has a rancid odor, throw it out.

Any chocolate that's left after dipping truffles or candies can be saved as long as nothing else has been mixed with it. Simply transfer the chocolate to a clean container or bowl, cover tightly, and store it at room temperature.



White chocolate isn't quite chocolate—it contains no chocolate liquor. With high percentages of cocoa butter and milk solids, it's the most temperature-sensitive of all chocolates.

Good chocolate should make you smile. The author buys her Callebaut in 15-pound blocks so she always has some handy.

Chocolate's complex flavors are best savored at room temperature, so if you've stored a chocolate cake or other dessert in the refrigerator, be sure to allow it to warm up before you serve it. Chocolate candies, confections, and some cakes and other desserts can be frozen if very well wrapped. Because rapid temperature changes can cause the chocolate coating to crack, frozen chocolates should be allowed to defrost for at least 24 hours in the refrigerator before they're brought out to stand at room temperature.

Carole Bloom is the author of the newly published The International Dictionary of Desserts, Pastries & Confections, as well as Truffles, Candies & Confections—Elegant Candy-making in the Home, and the forthcoming The Candy Cookbook. She has trained extensively throughout Europe and is a Certified Culinary Professional. ♦

