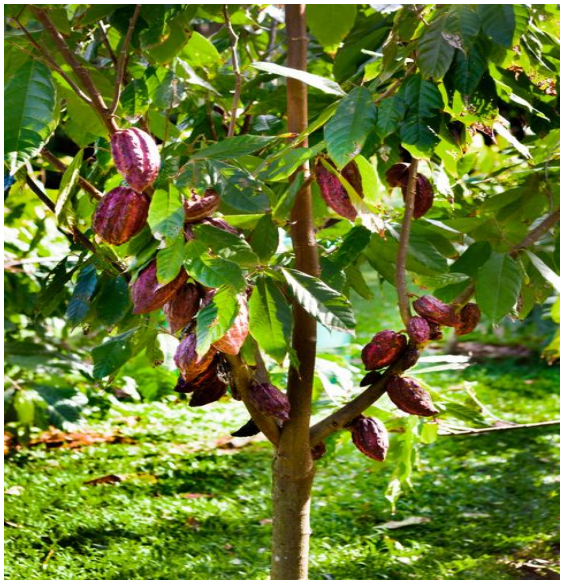
Chocolate: Sweet Satisfaction

by Marcia Amidon Lusted

If someone asked you about your favorite kind of candy, chances are you'd say chocolate. Fifty-two percent of Americans would agree with you. In fact, the average American eats 11 pounds of chocolate every year! But where does chocolate actually come from, and how does it become all those sweet treats that we love?



The Roots of Chocolate

Chocolate actually gets its start from a tree whose scientific name is *Theobroma cacao,* or "food of the gods." The first people who realized that the beans of this tree might be edible were the Olmecs (1500–400 B.C.E.), who crushed the beans, mixed them with water, spices, chilies, and herbs, and drank the concoction. Later, the Aztecs also drank a bitter chocolate mixture, believing it to be a sacred drink to be used only for religious ceremonies. Cacao beans were so valuable that the Aztecs even used them for money.

When the Spanish explorer Hernando Cortés and his soldiers encountered the Aztec civilization in 1519, they learned about chocolate from observing the Aztec emperor Montezuma drinking it from a golden cup. Later, the Aztec people offered Cortés and his men the drink, and Cortés liked it so much that he brought his own supply of cacao beans back to Spain. The new drink was introduced to Spanish King Charles V and then quickly spread across Europe, although the European version was sweetened with sugar and honey. The craze for the *sweet* chocolate we love was born.

Bitter Beans to Sweet Chocolate

Cacao beans are nestled in the pulp of Theobroma cacao tree's fruit.

As much as people all over the world love chocolate, it is not easy to harvest enough cacao beans to feed that desire. The cacao tree is notoriously fussy about its environment and only grows in the tropics—in fact, almost exclusively within 10 degrees of latitude of the Equator. The trees need frequent rainfall, high humidity, warm temperatures, and partial shade. They can grow to be as much as 40 feet tall, with big,

broad leaves and small fragrant blossoms. These blossoms develop into hard, football-shaped fruits that take five to six months to ripen. The seeds that will eventually become chocolate grow in the pulp within these fruits. Most of the world's supply of cacao beans comes from the Côte d'Ivoire (the Ivory Coast) and Ghana regions of West Africa. The Côte d'Ivoire alone produces 1.4 million tons of cacao beans a year, and Ghana follows with about 600,000 tons. Indonesia, Brazil, Ecuador, Togo, Mexico, and Papua New Guinea also export cacao beans in smaller amounts.

Cacao seeds begin their journey to becoming chocolate by fermenting in piles of their own pulp, sandwiched between large banana or palm leaves. Over a period of a week, the leaves are periodically flipped. This helps leach some of the bitterness from the seeds. Then the seeds are dried on wooden mats in the hot African Sun for up to two weeks. Next, the beans are sent to a factory and roasted—now they actually smell like chocolate! The roasted beans are separated from their shells and chopped into tiny pieces called *nibs,* before being ground or milled. Using heat and pressure, the ground nibs are compressed and become two liquids: a clear fat called *cocoa butter,* and a dark fragrant liquid called *cocoa liquor* (which is not alcoholic). These are two of the main ingredients of chocolate bars. All that is needed to make the chocolate less bitter is (you guessed it)—sugar—or in the case of milk chocolate, sugar and dried whole milk to soften the flavor for people who don't like the dark-chocolate taste. From here, the chocolate is made into all the delicious sweet creamy treats that chocolate lovers crave.

Delicious . . . and Healthy Too?

So, back to that 11 pounds of chocolate you're going to consume this year . . . empty calories. Or is it true that sweet chocolate can actually be good for you?

On a basic level, eating chocolate, which contains the essential amino acid tryptophan, stimulates the release of *serotonin,* a neurotransmitter that helps make people feel calm and relaxed and typically less anxious. Eating chocolate also triggers the release of *endorphins,* hormones that reduce sensitivity to pain and provide a sense of well-being. In addition, chocolate contains the chemical phenylethylamine, one of many chemicals that humans release when they fall in love. Eureka! Now we know why chocolate is often linked to the feeling of being in love, which (along with some savvy marketing) has helped make a box of chocolates one of the most popular Valentine's Day gifts (along with roses) ever.

Chocolate also contains caffeine and the compound theobromine, which are both stimulants.

All these aspects of chocolate chemistry make us crave it, to the point that some people insist that they are "chocoholics."

Rich, dark chocolate has physical health benefits as well. It provides natural substances called *flavinoids,* which some studies show help prevent heart disease and cancer. The flavinoids in chocolate that have demonstrated powerful ***antioxidant*** effects are called *flavanols* and *procyanidins.* They come from the same family as the flavinoids *reseveratrol* and *EGCG,* found in grape juice and green tea, that have been linked to longevity. When humans eat

these kinds of flavinoids, the antioxidant levels in their blood rise and help protect the body from damage to the heart and blood vessels. Flavanols and procyanidins also improve the flow and function of blood vessels. These compounds also boost the body's production of nitric oxide, which helps reduce blood pressure. Chocolate may also work as a cough suppressant, and to slow cancer cell growth. Experiments with chocolate-fed mice have suggested that flavenol-rich cocoa stimulates neurovascular activity, enhancing memory and alertness.

Antioxidant *— A substance that may protect your cells from harm*

So, is it time to run out and buy a huge stash of oversized chocolate bars and other sweet chocolate treats? Not quite. Chocolate also contains fat and sugar. And while the type of saturated fat found in chocolate—stearic acid—is unique because it doesn't raise blood ***cholesterol,*** chocolate bars still contain 200 calories or more. Dark chocolate generally has more flavenols than milk chocolate, and higher-quality chocolate is generally healthier, because it doesn't contain added saturated or hydrogenated fats that are bad for cholesterol levels. Still, a serving of sweet pineapple or sweet potato is healthier, with fewer calories. A cup of green tea has antioxidants and no calories at all.

Cholesterol *— A fatty deposit in the arteries that can contribute to heart disease*

Chocolate is definitely one of those rare foods that taste great and are (in moderation) really good for us. It's an irresistible combination of sweet science and satisfaction. So what are you waiting for? What's *your* favorite kind of chocolate? Get some!

The Fountain of . . . Chocolate!

A fountain of warm, molten chocolate, cascading over several tiers and ready to deliciously coat strawberries and all sorts of finger food with sweet, creamy goodness is most chocoholics' dream. But just how does a chocolate fountain work? Much like a water fountain, a chocolate fountain is a structure of tiers, in this case made of stainless steel. Chocolate is continuously pumped to the top of the fountain, where it falls from tier to tier in a controlled manner, without splashes or spatter. Once the chocolate reaches the bottom reservoir, it is recirculated to the top level by the pump mechanism. The chocolate is warmed with an internal heating element to keep it at the optimum temperature for good "flow."

Not just any kind of chocolate works well in a fountain. The best fountain chocolate contains a greater percentage of fat, which can be cocoa butter or the less expensive (and less tasty) vegetable oil. Without the extra fat the chocolate would be too thick to flow properly. The extra fat thins the chocolate so that it can be drawn up through the pump, and then cascade attractively down the fountain's tiers.