

Chocolate Facts and Fallacies

Weight Management

For many people, weight control is a lifelong challenge. Experts believe that saying no to favorite foods is not the answer. If you deprive yourself of the foods you love, eating healthfully may be more difficult. So instead of cutting out foods that taste good, eat small amounts and continue to follow the Food Guide Pyramid.

Be sure to include physical activity as part of your daily routine. Keeping active can help weight management and improve your general health.

Addictions and Cravings

All of the scientific research on the subject shows that people desire chocolate because of its aroma, creaminess and satisfying flavor. There is no such thing as a chocolate “addiction.”

Scientists have studied food cravings in both men and women. While men generally crave spicy foods like pizza, chocolate is the food women say they crave the most. It's the sensory properties of a food that make it desirable rather than a specific compound in the food that makes it irresistible.

Allergies, Headaches, and Migraines

Many people say that they are allergic to chocolate, but a true chocolate or cocoa allergy is rare and difficult to prove. Chocolate is sometimes blamed for allergies caused by other ingredients added to chocolate during processing, including corn syrup, lecithin, gluten, and nuts. See a board-certified allergist if you suspect that you have a food allergy or sensitivity.

Some people complain of headaches and migraines after eating chocolate. These are not signs of true food allergy, but may be due to a food intolerance or sensitivity. Genetics, lifestyle, medications, and hormonal changes can make headaches and migraines more severe.

Heart Disease, Cholesterol, and Diabetes

Fat restriction is essential for those with heart disease, but chocolate still can be included by making trade-offs. For example, if you have an average bar of chocolate (1.4 ounces), either omit the tablespoon of mayonnaise on your sandwich or use fat-free dressing instead of two tablespoons of regular dressing on your salad.

Cocoa butter, the fat in chocolate, might be expected to increase blood cholesterol levels because it contains saturated fat. But studies have shown that, when consumed as part of a balanced eating plan, chocolate in moderation does not increase blood cholesterol levels.

Chocolate and other sweets do not cause diabetes. Nor does chocolate need to be completely avoided by persons with diabetes. Chocolate can add flavor and enjoyment when used as an occasional treat as part of a well-balanced diet.

If you have heart disease, high blood cholesterol, or diabetes, and enjoy chocolate, talk to a registered dietitian (RD) to find out how you can include it in your personal meal plan.

Tooth Decay

Tooth decay is affected by how often you eat starchy or sweet foods and how long those foods stay in your mouth.

You are less likely to get cavities if you eat cavity-causing foods less frequently throughout the day.

Brush your teeth thoroughly, rinse with water, or chew sugarless gum after eating sugary or starchy foods that could stick to your teeth. Visit the dentist regularly.

Sugar, Chocolate, and Hyperactivity

Chocolate and sweets are often blamed when children get overly wound up. But experts have found that sugar has no adverse effects on the behavior of most children. Children tend to get excited during parties and other celebrations. The special event, not the foods eaten, is thought to be responsible for children's increased activity and excitement.

Chocolate is More Than Delicious; It May Be Good for Your Heart

Research Continues to Underline Chocolate's Antioxidant Benefits

(Vienna, VA) – Chocolate lovers will be delighted to know that more and more scientific evidence points to some important health benefits hidden in their favorite food. Certain types of cocoa and chocolate serve up a generous helping of antioxidants called flavonoids that may be good for your heart.

“Research on antioxidants is only in its infancy,” explains Penny Kris-Etherton, Ph.D., professor of nutrition at The Pennsylvania State University and author of a new study published in the *American Journal of Clinical Nutrition* (Nov. 2001). “We already know that increased consumption of fruits and vegetables results in increased antioxidant levels in the blood. We now believe chocolate consumption may have the same effect.”

Antioxidants like those found in raw cocoa beans and fruits and vegetables appear to perform an important function in the blood stream. They essentially “mop up” free radicals, which can damage arterial walls in a process known as oxidation. Scientists believe free radicals may be triggers for heart disease and may be associated with cognitive deterioration associated with aging.

The most recent research reported at the American Heart Association Annual Meeting (Nov. 20, 2002) in Chicago supports earlier studies. Researchers at the University of California at San Francisco reported that certain types of dark chocolate caused blood vessel dilation within two hours of consumption. Blood vessel dilation is believed to be an important indicator of healthy blood vessel function and a healthy cardiovascular system.

“The exciting news here is that blood vessel dilation increased in subjects who ate this commercially available chocolate product,” said Marguerite M. Engler, Ph.D., R.N., who was one of the presenters at the AHA meeting and a participant in the study.

The earlier Penn State study investigated how flavonoids in cocoa and dark chocolate are absorbed and metabolized in humans. The eight-week study involved 10 men and 13 women between the ages of 21 and 62 years. Half the group ate a “typical American diet” intentionally low in flavonoids. The other half ate the same diet with one difference – the daily addition of small amounts of cocoa (three-quarters of an ounce) and dark chocolate (half an ounce). After four weeks, the two groups switched diets.

Blood tests clearly showed that while the subjects were on the cocoa-chocolate containing diet, they had higher HDL, or “good” cholesterol levels. “This is important because a higher ratio of high density lipoproteins to low density lipoproteins is associated with a decreased risk of heart disease,” explains Kris-Etherton.

Oxidation in the subjects’ bodies while on the cocoa-chocolate diet occurred at an eight percent slower rate compared to when they ate the typical American diet. This is beneficial because oxidation is linked with arterial damage and hardening of the arteries.

Other studies support the research published in the *Journal*. Ongoing research at the University of California at Davis, continues to underline the potential health benefits of chocolate’s flavonoids. Studies there appear to show that the flavonoids in some types of cocoa and chocolate reduce the body’s blood platelet reactivity, having an effect similar to that of taking a low dose of aspirin to help blood flow through the arteries.

“While all of this positive research doesn’t mean one should consume massive quantities of chocolate, it does suggest chocolate is more than just a delicious and desirable food. It can be a fun food with some health benefits,” said Kris-Etherton.

In the *Journal* study, Kris-Etherton concludes, “The incorporation of some types of chocolate and cocoa powder into a healthy diet is one means of effectively increasing antioxidant intake. Furthermore, the inclusion of dark chocolate and cocoa powder in a diet that is rich in other food sources of antioxidants, such as fruit, vegetables, tea and wine, results in a high antioxidant intake and may consequently reduce the risk of cardiovascular disease.”

The quality and quantity of flavonoids in raw cocoa beans are very high relative to fruits and vegetables and other common foods such as black tea and red wine. The amount of flavonoids in a chocolate bar or cup of hot cocoa depend in part on how the finished products are processed.

Research Shows "Chocolate Does Not Raise Cholesterol"

Stearic Acid Called "A Unique Saturated Fat"

Milk Chocolate in the diet, even when consumed on a daily bases over a long period of time, does not raise blood cholesterol levels in healthy young men, according to the Southwestern University Medical Center in Dallas. "This finding is exciting because it confirms past studies that stearic acid, the predominant saturated fat in milk chocolate, is a unique saturated fatty acid," said Dr. Penny Kris-Etherton of The Pennsylvania State University (PSU), principle researcher of three studies on the subject. "We knew that stearic acid is different from other saturated fats, because it has a neutral effect on blood cholesterol levels. Now we've taken this research a step further and applied it to a popular food product, chocolate." Cocoa butter, a large component of chocolate, is rich in stearic acid.

Kris-Etherton's study on 15 young men at PSU is the first to examine the relationship between high levels of milk chocolate consumption and blood cholesterol levels. "All of the participants in the study ate diets very high in different forms of saturated fat," said Kris-Etherton. "Only those who consumed saturated fat in the form of milk chocolate did not see a significant increase in the blood cholesterol level."

In the PSU study, participants consumed varied combinations of saturated fatty acids, in higher quantities (20 percent of total calories) than they normally eat. Those whose saturated fats came from the stearic acid in milk chocolate were the only group to show a neutral effect on the blood cholesterol level.

"Not surprisingly, those students who consume butter alone as a source of saturated fat had an increase in their cholesterol levels," said Kris-Etherton. "But we were interested and pleased to see that consuming milk chocolate, which contains cocoa butter along with a small amount of milk fat, did not raise the blood cholesterol."

Other research supports Kris-Etherton's findings. According to Dr. Scott Grundy, Ph.D., Director of the Center for Human Nutrition at the University of Texas, "We used to think that all kinds of saturated fat raised the cholesterol level, but now we know that there are several types of saturated fats, and they don't all act the same. Our research has shown that stearic acid simply doesn't increase the cholesterol level in blood the same way that other types of saturated fats do."

Nutritionists recommend that milk chocolate be eaten in moderation, but say that there is no reason that it cannot be included in a diet to control blood cholesterol. "There are no good foods and no bad foods, but rather there are good diets and bad diets," said Kris-Etherton. "When consumers pick up a milk chocolate bar and see on the nutrition label that it contains saturated fat, they need to remember that not all saturated fats are the same."

The Good News About Chocolate

Chocolate is one of the most popular foods in the world, long enjoyed for its wonderful taste. The cocoa butter in chocolate is unique because it melts at mouth temperature, slowly releasing rich chocolate flavor during eating. In addition to its savored taste, researchers are discovering new information about this cherished treat.

This paper discusses recent research on the potential benefits of chocolate, gives some insight into why we crave it, and dispels some common myths surrounding this small "indulgence."

Another Role for Chocolate in Our Diet

Researchers are discovering more and more attributes of chocolate in addition to its savored taste. In 1993, researchers at The Pennsylvania State University ¹ concluded that stearic acid, the main saturated fatty acid in chocolate, does not raise blood cholesterol levels. These researchers also reported ² that a 1.4 ounce chocolate bar eaten in place of a high carbohydrate snack does not raise LDL-cholesterol (the bad cholesterol) levels and increases HDL-cholesterol (the good cholesterol) levels.

In addition to its neutral affect on blood cholesterol levels, recent research has indicated a possible antioxidant benefit in chocolate similar to that found in red wine. Not only is chocolate and red wine a tantalizing combination for its sensational taste, but research shows these foods also contain antioxidants which may be good for health. In September, 1996, The Lancet ³ reported cocoa powder and chocolate contain a relatively high amount of phenolic

compounds, which possess antioxidant properties. Further, they found the compounds possess properties that may be beneficial in reducing the risk for coronary heart disease.

A 1.5 ounce chocolate bar contains about the same amount of total phenolic compounds as a 5-ounce serving of red wine, which has been associated with a reduced risk for coronary heart disease.

Currently, the American Cocoa Research Institute, the research branch of the Chocolate Manufacturers Association, is sponsoring a study to evaluate further the amount and types of antioxidants in chocolate products. The results of these studies will also provide additional information about the potential benefits of chocolate products in our diets.

Chocolate and Cravings

Many people describe their desire to eat chocolate as a "craving." In fact, studies have shown that chocolate is the single most craved food in the country.^(*4, *5) Experts are actively conducting research to determine causes of cravings. Much of this research has focused on chemicals in the brain called neurotransmitters that might affect one's mood and desire for different types of foods.^(*6, *7)

Serotonin and endorphins are two of the better-understood neurotransmitters. Serotonin is thought to help people feel calm and relaxed. It is believed that low levels of serotonin lead to craving for starches and for sweet foods like chocolate. This is because foods high in carbohydrate may help boost the amount of serotonin in the brain. A feeling of well-being is said to return with a raise in serotonin levels. Additionally, some researchers believe that serotonin is related to premenstrual syndrome (PMS) and may explain premenstrual cravings for foods containing carbohydrates (sugars and starches).^(*8,*9)

Endorphins are believed to be "feel good" neurotransmitters. In contrast to serotonin, endorphin levels appear to be affected by dietary fat—thus, it has been suggested that eating fat-containing foods like chocolate might increase endorphins and lift a person's mood.

Chocolate Myths Dispelled

Because chocolate has been around for so long and is a complex food, it is no surprise that many myths have been established surrounding this food. For example, contrary to what some believe, chocolate is not high in caffeine. In fact, the amount of caffeine in a typical 1.4 ounce chocolate bar or an 8-ounce glass of chocolate milk is about equivalent of that found in a cup of decaffeinated coffee.

What about candy and dental cavities? Candy alone does not cause cavities. A triad of elements causes cavities: susceptible teeth, dental plaque, and food.^(*10*) Dentists agree, the cavity causing potential of food is not necessarily related to sugar content, but rather to how often a food is eaten, the sequence of foods eaten and the amount of time the food remains in the mouth. In the diet, bacteria metabolize fermentable carbohydrates, from both sugars (e.g., candies, soda, fruit juice, jellies) and starches (e.g., rice, pasta, bread), and thus may lead to cavities.¹¹ To prevent dental cavities many factors are involved: regular fluoride use, proper oral hygiene, control of fermentable carbohydrates and application of plastic sealants.

To dispel another myth, neither chocolate nor sugar cause hyperactivity. Research has proven for years that sugar does not cause uncontrolled behavior in children. Both the Food and Drug Administration¹² and the 1988 Surgeon General's Report on Sugar and Health¹³ support these findings. Experts now believe that it is often the excitement surrounding a party or celebration that causes the exaggerated behavior rather than the foods that are consumed. Whether antioxidant benefits, neurotransmitter responses or your mother's favorite myth, the real reason we eat chocolate may not be so complex. We eat chocolate simply because it tastes good. Research continues to support what we have known for years—that chocolate can be enjoyed as an important part of a healthful and pleasurable diet.

Reviewed by: Mindy Hermann, MBA, RD, Nutrition Specialist, Mt. Kisco, NY. Information from: Chocolate Manufacturers Association, 7900 Westpark Drive, Suite A-320, McLean, VA 22102-4203, (703) 790-5011

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- ¹² Glinsmann WH, Irausquin H, Park YK. Evaluation of Health Aspects of Sugars Contained in Carbohydrate Sweeteners. Report of Sugars Task Force, 1986. Executive Summary. Washington, DC: Division of Nutrition Toxicology, Center for Food Safety and Applied Nutrition, Food and Drug Administration: 1986.
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Chocolate and Cravings

Many people describe their desire to eat chocolate as a "craving." In fact, studies have shown that chocolate is the single most craved food in this country, particularly by women. Men experience cravings less often than women, and when they do have cravings, men are more apt to long for foods like steak, hamburgers or french fries. Chocolate is often craved as a highly satisfying, small "indulgence." Research tells us that chocolate is so appealing because of its aroma, creaminess, and flavor-a perfect balance of sweetness and bitterness. The cocoa butter in chocolate is unique because it melts at mouth temperature, slowly releasing rich chocolate flavor during eating. Strict dieting or food deprivation can intensify cravings and may lead to binge eating. That is why many nutrition experts recommend satisfying one's craving by eating the desired food. However, contrary to popular belief, it is unlikely that the body needs the craved foods or specific nutrients in those foods.

Experts are actively conducting research to determine other causes of cravings. Recent research has focused on chemicals in the brain, called neurotransmitters, that might affect one's mood and desire for different types of foods. One of the better understood neurotransmitters is serotonin, which is thought to help people feel calm and relaxed. According to one theory, a decrease in serotonin levels leads to craving for starches and for sweet foods, like chocolate, because foods high in carbohydrates may help boost the amount of serotonin in the brain. A feeling of well-being is said to return with a rise in serotonin levels.

Additionally, some researchers believe that serotonin levels are related to premenstrual syndrome (PMS) and may explain premenstrual cravings for foods containing carbohydrates (sugar and starches).

Many different brain chemicals have been linked to eating and to cravings for certain types of food. Endorphins are believed to be "feel good" neurotransmitters. In contrast to serotonin, endorphin levels appear to be affected by dietary fat-thus, it has been suggested that eating fat-containing foods, like chocolate, might increase endorphins and lift a person's mood.

Perhaps the most important factor is that people simply like the taste of chocolate. So, while scientists search for complex technical reasons for chocolate cravings, the answer may be a simple one-chocolate just happens to taste good.