

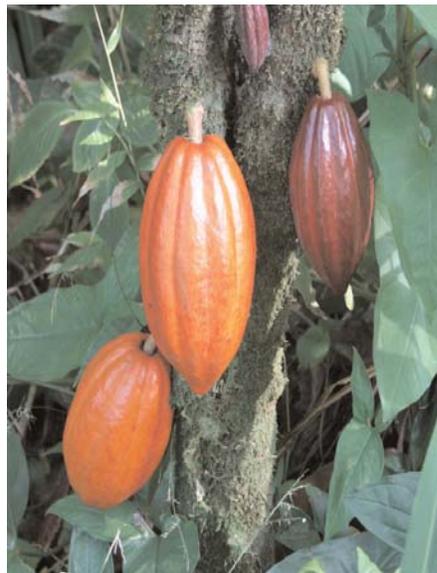
CHOCOLATE

Although chocolate as we know it has been with us for 500 years, the cocoa tree, the plant from which chocolate is derived has been actively cultivated for twice that time and known for 4000 years. The word chocolate came from the Aztec word 'xocolate' meaning bitter drink. The Mayans and Aztecs of Mexico believed that the Agriculture God sent the cocoa seed from paradise.

The explorer Cortes delivered the bean to his emperor in the early 1500s. The Spaniards improved the taste of the bitter drink by adding sugar and cinnamon and heating it. The chocolate bar was invented in the US in 1831 and in 1875 the Swiss company Nestlé introduced the process to create milk chocolate.

Structure/Components

It is the bitter seeds/beans of the cocoa that are used to make chocolate. The cocoa bean is 31% fat of which 60% is saturated fat. Two-thirds of the



fat is in the form of stearic acid, a saturated fat and the remainder in the form of oleic acid, a monounsaturated fat. Cocoa butter (derived from the cocoa seed) has more stearate than any other common edible fat or oil. Since cocoa butter is a vegetable fat, it does not contain any cholesterol. It also contains 14% carbohydrate and 9% protein. The protein from the cocoa plant is rich in the essential amino acids tryptophan, phenylalanine as well as tyrosine.

The cocoa seed also contains several pharmacologic agents such as:

- Biogenic amines e.g. tyramine and phenylethylamine
- Methylxanthines e.g. caffeine and theobromine
- Cannabinoid-like Fatty Acids that might play a role in

interacting with other constituents of chocolate such as caffeine and theobromine.

All these compounds may be involved in inducing physiological and/or psychological sensations in persons who consume chocolate. In all approximately 400 different chemicals have been identified in the cocoa seed. The high polyphenol content (6% of the bean) allows chocolate to stay fresh outside of the refrigerator in spite of the high fat content.

Types of Chocolate

Unsweetened Chocolate/Bitter Chocolate

- Also called chocolate liquor, unsweetened chocolate is the finely ground roasted cocoa nibs.
- Can be natural (dutch) or alkalinized to give a smoother flavour. Alkalinization will remove the polyphenols and reduce antioxidant properties.

Bittersweet/Semi-Sweet Chocolate

- Contains at least 35% unsweetened chocolate and less than 12% milk solids.
- Bittersweet chocolate often has an unsweetened chocolate content of 50% or more.
- Semi-sweet chocolate generally contains 35-45% unsweetened chocolate.

Sweet Chocolate (Dark)

- Contains at least 15% unsweetened chocolate and less than 12% milk solids.

Milk Chocolate

- Contains at least 10% unsweetened chocolate and 12% milk solids.

White Chocolate

- No official standard of identity exists yet for white chocolate.
- Typically made with cocoa butter (unsweetened chocolate with the cocoa solids removed), milk solids, sugar and flavourings.

In general, the darker the chocolate, the more chocolate liquor it contains – from 100% in unsweetened chocolate to 10% for milk chocolate. The darkest suitable chocolate will provide the most chocolate flavour. To be labeled “chocolate”, the only fat a product may contain is cocoa butter. Inferior products with labels such as “chocolate candy” may contain other vegetable fats instead.

Why do we Love Chocolate?

The underlying reasons for chocolate cravings are not clearly understood but believed to center around 4 main issues.

- The chemosensory characteristics of chocolate – i.e. taste, smell and texture which are in turn related to its high fat and sugar content. Chocolate simply tastes and smells good. Its complex food flavour and aroma are due to the presence of 30-50 chemical compounds and it literally melts in your mouth since

cocoa butter has a low melting point and a creamy texture.

- Psychopharmacological effects of chocolate or its constituents which are believed to induce the physiological or psychological sensations that are behind chocolate cravings. It is thought that the cravings are related to the phenylethylamine content. Phenylethylamine when ingested, begins a process that leads to increased levels of dopamine in the brain. Dopamine is thought to be the chemical that allows us to feel pleasure.
- Self medication for dietary deficiencies such as magnesium or to balance low levels of neurotransmitters that work in the regulation of mood, food intake or compulsive behaviours
- The association of chocolate cravings with monthly hormonal cycles and mood swings in women which results in chocolate craving being more common in women than in men.

But is it Good for Us?

The health benefits of chocolate have been widely debated. So it is important to point out where the evidence exists. So far studies involving chocolate have suggested that its health benefits are derived from chocolate's flavanoid content. Flavanoids are naturally-occurring compounds found in plant-based foods. Flavanoids are

reported to have potential beneficial effects on human health including, anti-viral, anti-allergy, anti-inflammatory and anti-oxidant effects.

Antioxidants are believed to help the body's cells resist damage caused by free radicals. When the body lacks adequate levels of antioxidants, free radical damage can occur, leading to atherosclerosis (build up of fatty deposits in artery walls) and to heart disease and other chronic diseases.

Chocolate in its purest sense i.e. the cocoa powder, is a beneficial food. It has the highest amounts of the flavanoids. The cocoa butter is a vegetable fat high in saturated fats, but its most predominant saturated fat – stearic acid does not appear to raise the levels of low density lipoproteins (bad cholesterol) and serum cholesterol and the others have no net effect on cholesterol levels.

Is it Bad For You?

Chocolate as a "health food" is a fairly new concept. Usually chocolate is described as being bad for you. It has been implicated in many diseases and conditions. These include acne, dental cavities, allergies, cancer diabetes mellitus, heartburn, infection, kidney stones, migraine headaches and premenstrual syndrome.

There is no scientific evidence that chocolate either causes acne or makes it worse. Some argue that if anything chocolate actually reduces



acne as it acts as a stress buster and promotes a feeling of calm and happiness. Since stress can cause breakouts – chocolate beats stress, therefore beats acne!

Also, chocolate does not necessarily cause dental cavities. However chocolate in the form in which it is usually consumed i.e. in milk chocolate or candy bars contain large amounts of sugar which is a known cause of tooth decay and may well counteract the effects on the antibacterial agents. Still chocolate causes no more tooth decay, than any other type of sweets.

The connection between chocolate and migraine headaches is not as clear. Some studies suggest that chocolate does not trigger

headaches (specifically migraines) any more than other substances.

To Have or Not to Have?

Chocolate has been linked to increased heartburn and acid reflux in some persons. People with chronic heartburn are advised to avoid chocolate. Chocolate consumption can also cause kidney stone formations. This effect is due to the increase in oxalate excretion and calcium excretion that follows ingestion of chocolate. These changes promote stone formation, therefore persons prone to kidney stones are asked to avoid chocolate, or to drink a lot of water when chocolate is consumed.

Chocolate does have a role to play in a healthful diet. It can offer some health benefits but it is high in calories due to its high fat content and should be consumed in moderation and also chosen wisely. Some chocolates are better for you than others. Bitter or dark chocolate is a far better choice than the sweeter varieties. The dark chocolate will have the maximum amounts of the health promoting antioxidants, and is without the added milk fats, and sugars (and therefore lower in calories) that the other more widely eaten varieties contain. White chocolate confers none of the health benefits usually associated with chocolates.

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