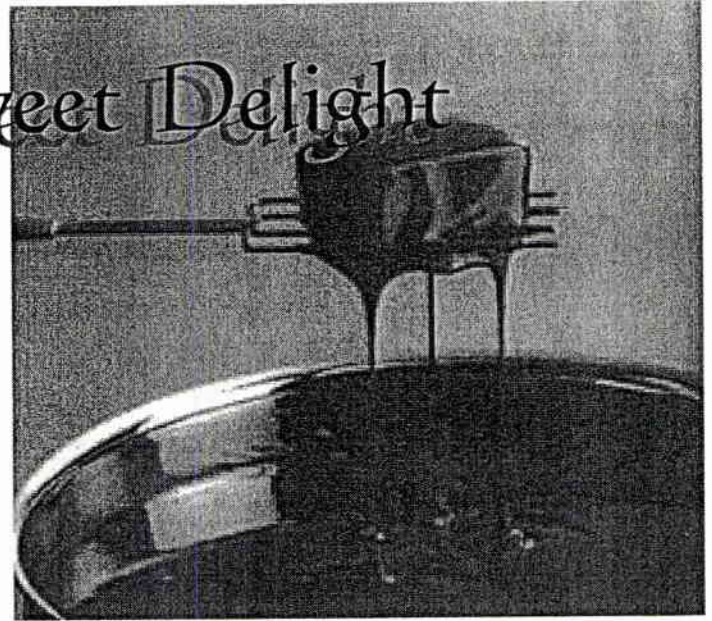


# Chocolate: A Sweet Delight

*There are now many studies that have found a link between chocolate and good health. Now, people can eat and enjoy chocolate without the guilt they once felt.*

By **MATTHEW DANG**



Chocolate is enjoyed by millions of people today. Recently, there have been studies that have discovered that eating chocolate is not just a delicious treat, but could also benefit our health. According to the *Journal of Agriculture and Food Chemistry*, there has been a study that found that Harvard male graduates who ate a fair amount of chocolate when compared to non-chocolate consumers had a 36% reduced risk of death. From this correlation, scientists speculated that this reduced risk might be due to the antioxidants found in chocolate. (Vinson et al., 1999).

Scientists have discovered that the key ingredients in chocolate that benefit our health are flavonoids, which are natural antioxidants. Flavonoids are a group of polyphenolic compounds found in fruit, vegetables, tea, dark beer, and red wine. Chocolate, as well as cocoa, happens to be an important and rich source of flavonoid, specifically catechins and oligomers (i.e. procyanidins). In comparison, dark chocolate has four times the amount of catechins as a cup of black tea.<sup>2</sup> (Wan et al., 1999). As well, the flavonoid content increases as the chocolate gets darker.<sup>3</sup> (Mayo Clinic Scottsdale, 2001).

Flavonoids, as natural antioxidants, work by absorbing free radicals in the body. Antioxidants seem to protect against heart disease, and there is a correlation between reduced levels of cardiovascular disease and a diet rich in flavonoids.<sup>4</sup> (Cariati, 2001). Arteriosclerosis, or heart disease, is said to be initiated by the oxidative modification of Low-Density-Lipoproteins (Wan et al., 1999); bad cholesterol, which is the essential step in the creation of artery-clogging plaque;<sup>5</sup> (Raloff, 2001); and fatty acid buildup in arteries (Cariati, 2001). The flavonoids in chocolate and cocoa help fight and form a potential protective barrier against the risk of cardiovascular disease by inhibiting LDL oxidation. Flavonoids work by binding to LDL particles and "reducing oxidation-mediated events in the hydrophilic environment of LDL particles or at a cellular level, such as in the arterial wall" (Wan et al., 1999).

Additionally, Dr. Tissa Kappagoda and colleagues have discovered that flavonoids in chocolate help "blood vessels to relax and help prevent coronary arteriosclerosis, better known as hardening of arteries" and "by dilating the blood vessels, flavonoids help keep the blood flowing to the heart."<sup>6</sup> (Firfer, 2000). According to Vinson et al. in the *Journal of Agriculture and Food Chemistry* 1999, chocolate's flavonoids are more powerful than vitamins (e.g. ascorbic acid) in effectively limiting oxidation of cholesterol circulating in LDL (Raloff, 2001). There have been tests, which indicated that the flavonoids in chocolate prevent LDL oxidation in-vitro by absorbing radical species of metal ions (Wan et al., 1999). Dr. Penny Kris-Etheron from Pennsylvania State University also agrees after a test showed that men who ate a lot of

chocolate did not have increased cholesterol levels (Cariati, 2001). Moreover, the flavonoids in chocolate are effective in increasing antioxidative intake and raising the concentration of an individual's high-density-lipoprotein (HDL) cholesterol, which is the good kind of cholesterol.

Although there have been many discoveries concerning chocolate, little is known about the absorption and metabolism of this delicious candy. What is known is that chocolate has a higher flavonoid antioxidant quantity-quality index than fruit, vegetables, red wine, and black tea (Wan et al., 2001). For acid equivalence, cocoa phenols inhibit LDL oxidation by 75%, and red wines inhibit LDL oxidation by 37-65%. There is said to be 4000 flavonoids that have been identified in plants. Flavonoids are the largest group of plant polyphenols and are part of a vast class of antioxidant phytochemicals in the plant kingdom.<sup>7</sup> (Gaby, 2002).

To sum up, the more chocolate eaten gives an individual a better shot at fighting heart disease. There are also many risks, however, that come when eating a large amount of chocolate. Chocolate is high in fat and contains a high amount of sugar and calories per serving (Gaby, 2002). Also, in chocolate there are many chemicals that affect the brain and nervous system, although there is uncertainty with regards to this issue in the scientific community (Gaby, 2002). Furthermore, the more chocolate that is consumed means an individual has a higher risk of obesity, which can then lead to an increase risk of heart disease. Nevertheless, the benefits from chocolate and cocoa outweigh the risks and problems if eaten in moderate but sensible amounts.

Bon Appetit!

