

Chocolate and prevention of cardiovascular disease: a systematic review

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Cardiovascular disease (CVD) represents the primary chronic disease in industrialized countries and the leading cause of death in these populations. Chocolate is viewed as a food with little nutritional value. Given the worldwide increasing in chocolate consumption and rising of global CVD, it is important to establish chocolate's association with CVD risk.

There have been a large number of epidemiological and observational studies that evaluate evidence of cocoa and chocolate products. The presented meta-analysis focus on the potential benefits of chocolate components - stearic acid and flavonoids - on the risk of CVD endpoints and mortality, since the antioxidants flavonoids are postulated to be the agents responsible for health benefits.

This meta-analysis contains a total of 136 English-language MEDLINE publications from January 1965 through June 2005 regarding clinical, experimental and observational studies that reflect the relation between the consumption of chocolate and its components - stearic acid and flavonoids and the principal outcome of CVD - coronary heart disease and stroke.

The majority of studies of *dietary stearic acid* indicates neutral effects on the traditional CV risk factors, with even favorable lowering of serum triglycerides.

The large body of evidence from laboratory findings and short term randomized chocolate feeding trials, suggest that *high - flavonoids* chocolate may protect against platelet aggregation and LDL oxidation, improve endothelial function, lower blood pressure and reduce inflammation. Thus, results from this meta-analysis indicate a strong protective association between flavonoid intake and risk of CVD mortality (with RR = 0,81, p<0,05) when comparing highest with lowest tertiles. Also, given the fact that dark chocolate has higher levels of flavonoids than milk chocolate, it would be indicated to consume dark chocolate rather than milk chocolate; an intake of 50 g/day of dark chocolate associating a reduce of CVD risk by 10,5%.

In conclusion, based upon multiple evidence from laboratory findings and randomized trials, this meta-analysis suggest that stearic acid may be neutral, while flavonoids from chocolate are protective against CVD.

Comment on the paper:

Ding EL, Hutfless SM, Ding X, Girotra S – Chocolate and Prevention of Cardiovascular Disease: A Systematic Review. *Nutrition and metabolism* 2006; 3:2.