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# POTENTIAL BENEFITS OF DARK CHOCOLATE IN PREVENTING CARDIOVASCULAR DISEASES: A SYSTEMATIC REVIEW

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**ABSTRACT**

Chocolate is a raw or processed food produced from the seed of the tropical tree *Theobroma cocao.* Dark chocolate, rich in bioactive compounds like catechins, procyanidins, and theobromine offers cardiovascular benefits such as improved blood pressure, reduced platelet aggregation and enhanced endothelial function. It reduces the risk of atherosclerosis by restoring the flexibility of the arteries and preventing WBCs from attaching to the walls of the blood vessels. According to the United States Department of Agriculture, 101gms bar of dark chocolate with 70-85% cocoa solids provides 604 calories, 7.87g of protein, 11g of dietary fibre, 23g of magnesium, 12.2g of iron, and 3.34g of zinc. Flavanols in dark chocolate boost nitric oxide production, dilating blood vessels, improving blood flow, and lowering blood pressure which helps prevent blood clots. Combining dark chocolate with almonds reduces harmful cholesterol particles, lowering the risk of heart disease. Dark chocolate contains theobromine which has the same characteristics as coffee, notably enhanced alertness, motivation to work, and energy. The flavonoids in dark chocolate also aid in diminishing insulin resistance. Furthermore, dark chocolate has a low glycaemic index.

**KEYWORDS:** *Dark chocolate, Benefits, Cardiovascular disease, Flavonoids, Heart health.*

## INTRODUCTION

Chocolate is a raw or processed food produced from the seed of the tropical tree *Theobroma cocao.* Dark chocolate, rich in bioactive compounds like catechins, procyanidins, and theobromine offers cardiovascular benefits including improved blood pressure, reduced platelet aggregation and enhanced endothelial function. Dark chocolate contains a higher percentage of cocoa solids and cocoa butter compared to milk chocolate, is known for its rich, bittersweet taste and potential health benefits. Unlike milk chocolate, dark chocolate typically contains little to no milk solids, making it a more concentrated source of antioxidants and other beneficial compounds. The darker the chocolate, the better, as it generally contains more cocoa and fewer added sugars. For optimal health benefits, dark chocolate with 70% or higher cocoa content is widely considered the best choice, as it provides a potent dose of flavonoids, particularly flavanols, which have been shown to improve heart health.

According to the United States Department of Agriculture, a 101-gram bar of dark chocolate with 70-85% cocoa solids provides 604 calories, 7.87 grams of protein, 11 grams of dietary fibre, 23 grams of magnesium, 12.2 grams of iron, and 3.34 grams of zinc. These nutrients, coupled with the high levels of antioxidants found in dark chocolate, contribute to its positive impact on cardiovascular health. Regular consumption of dark chocolate has been linked to

improved blood flow, reduced inflammation, and potentially lowered blood pressure. These benefits are largely attributed to the flavonoids, which help dilate blood vessels and improve circulation, ultimately promoting a healthier heart.

Dark chocolates reduce the risk of atherosclerosis by restoring the flexibility of the arteries and preventing white blood cells from attaching to the walls of the blood vessels. Just a small bite of dark chocolate a day can provide cardiovascular benefits, making it an easy and enjoyable addition to a heart-healthy lifestyle. By choosing dark chocolate with a high cocoa content and consuming it in moderation, individuals may be able to enjoy both the delicious taste and the heart-boosting benefits that come with it.

## AIM AND OBJECTIVE

• To identify the health benefits of dark chocolates.
• To understand the role of dark chocolates in preventing cardiovascular diseases.

## RESULT

Research has shown that flavanols in dark chocolate can stimulate the production of nitric oxide in the endothelium, which acts as a vasodilator. This leads to the dilation of blood vessels, improving blood flow and lowering blood pressure.

The enhanced circulation helps prevent blood clots by reducing inflammation and improving overall blood flow. Additionally, dark chocolate flavanols have been found to improve lipid profiles Consuming dark chocolate with 50–70% cocoa may reduce LDL cholesterol (also known as "bad") by 5% to 10% and raise HDL cholesterol (also known as "good") by 1% to 3%, according to a study published in the Journal of the American College of Cardiology.

Further studies have indicated that consuming dark chocolate in combination with almonds can reduce the amount of dense LDL particles, which are considered more harmful and a greater risk for heart disease. In fact, research has demonstrated that the risk of myocardial infarction is inversely associated with chocolate consumption. One study found that those who consumed more than three portions of chocolate per day experienced a 77% reduction in risk compared to those who consumed less than one portion.

Multiple dietary intervention studies in both humans and animals have supported these findings, showing that cocoa and other flavanol-rich foods or beverages can provide protective vascular effects. These studies suggest that the regular consumption of dark chocolate, rich in flavanols, may help improve cardiovascular health by promoting better blood flow, reducing inflammation, and improving lipid profiles, thereby lowering the risk of heart disease.

| | BEFORE | AFTER |
|---|---|---|
| Total cholesterol(mmol/L) | 4.6 ± 0.6 | 4.7 ± 0.4 |
| LDL cholesterol(mmol/L) | 2.8 ± 0.5 | 2.8 ± 0.4 |
| HDL cholesterol(mmol/L) | 1.5 ± 0.3 | 1.6 ± 0.3 |
| Triacylglycerol(mmol/L) | 0.7 ± 0.3 | 0.7 ± 0.4 |
| Heart rate(beats/min) | 67.5 ± 6.3 | 67.6 ± 4.5 |

## COCLUSION

In summary, dark chocolate, especially those with 70% cocoa or more, is not only a fabulous delicacy, but is also highly beneficial for one's health, particularly for the heart. Dark chocolate is rich in bioactive compounds like catechins, procyanidins, and even theobromine that improves blood pressure, reduces platelet aggregation, and helps in enhancing overall endothelial function. The high concentration of antioxidants in dark chocolate especially the flavanols vastly improves circulation, decreases inflammation, and promotes better heart health. Consumption of dark chocolate has led to decreased risk of atherosclerosis, improved lipid profile, and enhanced vascular health. Further evidence has demonstrated that dark chocolate helps reduce bad cholesterol while elevating good cholesterol, which is beneficial for the heart and with reduced risk for heart diseases.

Moderation is key in maximizing the positive effect dark chocolate can have when coupled with a healthy lifestyle. In the end, choosing dark chocolate with higher cocoa content can practically aid in improving heart health.

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## REFERENCE

1. Monahan KD. Effect of cocoa/chocolate ingestion on brachial artery flow-mediated dilation and its relevance to cardiovascular health and disease in humans. Archives of biochemistry and biophysics, 2012 Nov 15; 527(2): 90-4.
2. Chaitman BR, Schmitz HH, Keen CL. Cocoa flavanols and cardiovascular health. US Cardiol, 2005; 2(1): 23-27. doi: 10.15420/usc.2005.2.1.23.
3. Kerimi A, Williamson G. The cardiovascular benefits of dark chocolate. Vascul Pharmacol, 2015 Aug; 71: 11-5. doi: 10.1016/j.vph.2015.05.011.
4. Yang J, Zhou J, Yang J, Lou H, Zhao B, Chi J, Tang W. Dark chocolate intake and cardiovascular diseases: a Mendelian randomization study. Sci Rep., 2024; 14: 968. doi:10.1038/s41598-023-50351-6
5. Galleano M, Oteiza PI, Fraga CG. Cocoa, chocolate, and cardiovascular disease. Journal of cardiovascular pharmacology, 2009 Dec 1; 54(6): 483-90.

6. Rees A, Dodd GF, Spencer JPE. The effects of flavonoids on cardiovascular health: a review of human intervention trials and implications for cerebrovascular function. Nutrients, 2018 Dec 1; 10(12): 1768. doi: 10.3390/nu10121768
7. Ding EL, Hutfless SM, Ding X, Girotra S. Chocolate and prevention of cardiovascular disease: a systematic review. Nutrition & metabolism, 2006 Dec; 3: 1-2.
8. Vlachopoulos C, Aznaouridis K, Alexopoulos N, Economou E, Andreadou I, Stefanadis C. Effect of dark chocolate on arterial function in healthy individuals. American journal of hypertension. 2005 Jun 1; 18(6): 785-91.
9. Higginbotham E, Taub PR. Cardiovascular benefits of dark chocolate?. Current treatment options in cardiovascular medicine, 2015 Dec; 17: 1-2.
10. Garcia JP, Santana A, Baruqui DL, Suraci N. The Cardiovascular effects of chocolate. Reviews in cardiovascular medicine, 2018 Oct 1; 19(4).