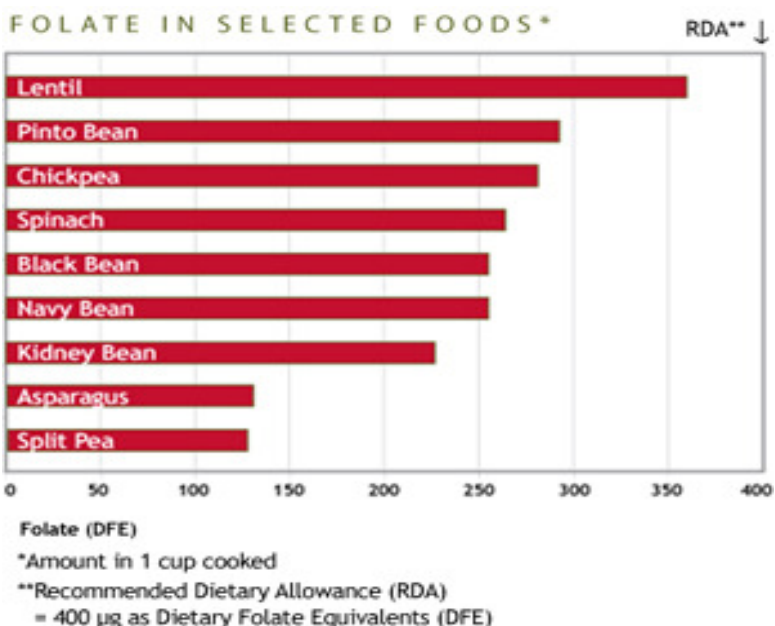


Beans and Cardiovascular Disease

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Introduction

Heart disease remains the leading cause of death in the United States (1). Factors that increase one's risk of developing heart disease include high levels of total cholesterol and LDL cholesterol ("bad cholesterol"), low levels of HDL cholesterol ("good cholesterol"), obesity, diabetes, smoking, and high blood pressure. Both what you eat and how you live can alter one's risk of heart disease (2-4).



TOTAL DIETARY FIBRE*

	Fibre (grams)	Percent Daily Value**
Navy Bean	19.1	76%
Split Pea	16.3	65%
Lentil	15.6	62%
Pinto Bean	15.4	62%
Chickpea	12.5	50%
Bran Flakes	7.1	28%
Whole wheat spaghetti	6.3	25%
Whole wheat bread	3.8	15%

*Amount in 1 cup cooked, except for Bran Flakes (1 cup dry) and whole wheat bread (2 slices)

**Recommended daily value = 25 grams fibre/day

How Beans Can Help Reduce the Risk of Heart Disease

Only one epidemiological study has examined the frequency of legume consumption and risk of coronary heart disease in US men and women. After adjusting for confounding risk factors, individuals consuming legumes at least 4 times per week were found to have a 22% lower risk of heart disease than individuals consuming legumes less than once per week (4). In the Health Professionals Follow-up Study, men that adhered to a more "prudent diet" which included greater consumption of whole grains, legumes, fish, and poultry had a 30% lower risk of having heart disease. Conversely, individuals following a more "Western" diet, characterized by increased consumption of red meat, refined grains, sweets, French fries, and high fat desserts had a higher risk of heart disease (3). Similar trends were seen in the Nurses Health Study (5). The relative risk of coronary heart disease in the 20% of women that followed the "prudent" dietary pattern more closely was 0.76 compared to 1.46 for women eating a "Western" type pattern (5). Thus, those that most consistently ate the "prudent" type of diet had one half the risk of developing heart disease

compared to those that most often ate the "Western" type of diet.

A 1% reduction in total cholesterol corresponds to about a 2% decrease in the risk of developing heart disease (6). Beans are a good source of soluble dietary fiber, containing approximately 4 g per 1cup cooked portion (7). Soluble fiber has been shown to reduce blood cholesterol in epidemiologic (8), clinical (9-12), and animal (13, 14) studies. Data from several human intervention trials indicate that consumption of canned (11, 15, 16) and dry beans (11, 12, 17-19) reduce serum cholesterol. Differences in experimental design, the control diet used, and heterogeneity in the intervention groups make direct comparisons among the studies difficult. Only two studies (20, 21) did not find favorable changes in serum lipoproteins when beans were consumed. Generally, in carefully controlled clinical studies where the macronutrient intake was matched and the fiber content in the bean fed group was at least twice that of the control diet, significant reductions in both total and LDL cholesterol occurred (9, 11). Significant increases in HDL cholesterol (11, 12, 16) and/or reductions in triglycerides (12, 22) were also seen in many but not all of the studies (9, 11). The consumption of dietary fiber in the US is only 12-13 g/day, well below the recommended 25-35 g/day. Incorporating one cup of cooked beans into the diet would add 12 g of total fiber and 4 g of soluble fiber per day. This increase in fiber intake would be expected to modestly lower serum cholesterol and risk of heart disease, especially in hyperlipidemic individuals.

In addition to cholesterol, recent attention has focused on high levels of plasma homocysteine as an independent risk factor for vascular disease (23, 24). Using meta-analysis, Boushey et al. (23) determined that individuals with elevated homocysteine had 1.7 to 2.5 times greater risk for developing cardiovascular disease. In the Framingham Heart Study 29.3% of the subjects had elevated homocysteine (>14 umol/L). Within this group, plasma homocysteine was inversely related to plasma folate levels and with intake of dietary folate and vitamin B6 (24). Cleophas (25) suggests that increasing the consumption of folate-containing foods may lower the prevalence of vascular disease in people with elevated homocysteine. Controlled studies examining the potential of folate-containing foods to reduce homocysteine and therefore vascular disease need to be conducted (25). The current RDA for folate is 400 mg/day for adult men and women, and beans provide a significant amount of folate (approximately 110 mg per cup of cooked beans), ranging from 140 mg in blackeyed peas to 87 mg in red kidney beans (calculated from (26)).

Beans also contain compounds called phytonutrients. Phytonutrients are non-essential compounds in foods that can provide health benefits and some of the phytonutrients found in beans have been reported to reduce risk factors associated with cardiovascular disease.

Eating beans can help maintain desired weight, can help reduce blood glucose, insulin, and cholesterol concentrations, and can help reduce the incidence and adverse consequences of diabetes. Thus, eating beans will help reduce your risk of premature atherosclerosis (heart attacks, strokes, and peripheral vascular disease). Of course other dietary factors, lifestyle and genetic background all strongly influence cardiovascular risk. Eating beans is just one practice that you can do to help reduce cardiovascular disease.

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