



NUTRITION / DETOXIFICATION

## How Components of the Mediterranean Diet Reduce Heart Disease and Stroke Risk

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Earlier this year *The New England Journal of Medicine* published findings from the study known as "Primary Prevention of Cardiovascular Disease with a Mediterranean Diet" ([the PREDIMED study](#)), which showed that a Mediterranean diet supplemented with extra-virgin olive oil and/or tree nuts (hazelnuts, almonds, walnuts) reduced the risk of cardiovascular death, myocardial infarction (heart attack) or stroke by 30 percent.<sup>1</sup>

The study group involved a total of 7,447 people who were followed for major cardiovascular risk factors. They were divided into three dietary intervention groups: a Mediterranean diet supplemented with extra-virgin olive oil, a Mediterranean diet supplemented with nuts (walnuts, almonds, hazelnuts), and a low-fat diet (animal and vegetable). A dietitian visited the patients every three months and patients attended dietary training group sessions, in which they received detailed information about the diet they were to follow. Participants were also provided with shopping lists, menus and recipes adapted to each diet type and each season of the year.

During the five-year study period, participants who followed either of the two types of Mediterranean diet were given (free of charge) extra-virgin olive oil (one liter per week) or nuts (30 grams per day; 15 grams of walnuts, 7.5 grams of almonds and 7.5 grams of hazelnuts). After five years, study results showed that individuals who followed either of the two types of Mediterranean diet had a substantially reduced risk of suffering cardiovascular death, myocardial infarction or stroke.

### Risk Factors Affected by the Mediterranean Diet

Previous studies have shown that components of the Mediterranean diet favorably affect a number of risk factors for cardiovascular disease and cancer. For example, [a study](#) by M. Konstantinidou, et al., showed that healthy volunteers who were provided with virgin olive oil rich in polyphenols showed significant down-regulation (inhibition) in the expression of atherosclerosis-related genes in their peripheral blood mononuclear cells.



The ingestion of virgin olive oil rich in polyphenols also resulted in a significant impact on the expression of other genetic changes influencing coronary heart disease, and reduced the degree of lipid and DNA oxidation, insulin resistance (which often improves with decreased oxidative damage to insulin receptors), inflammation and carcinogenesis. It also enhanced tumor suppression. By comparison, the individuals following their usual diet, and individuals provided with olive oil that was low in polyphenol content, did not show any marked improvement in risk factors for cardiovascular disease or cancer.

These results strongly suggest that the polyphenols in certain virgin olive oils are an important reason for the reduction in cardiovascular disease and cancer biomarkers, as well as inflammation, in patients consuming virgin olive oil rich in polyphenols.<sup>2</sup> A number of other studies have shown that plant-based polyphenols (including those from olives) have the potential to reduce [inflammation](#), including inflammation associated with coronary heart disease, with specific effects on endothelial cells via down-regulation of LDL-oxidation.<sup>3-5</sup>

Top 25 Richest Food Sources of Polyphenols (per serving)

1. Black elderberry
2. Black chokeberry
3. Black currant
4. Highbush blueberry
5. Globe artichoke heads
6. Coffee, filtered
7. Lowbush blueberry
8. Sweet cherry
9. Strawberry
10. Blackberry
11. Plum
12. Red raspberry
13. Flaxseed meal
14. Dark chocolate
15. Chestnut
16. Black tea
17. Green tea
18. Pure apple juice
19. Apple
20. Whole-grain rye bread
21. Hazelnut
22. Red wine
23. Soy yogurt
24. Cocoa powder
25. Pure pomegranate juice

Honorable Mentions (in the top 50)

- Black olives
- Spinach
- Pecans
- Black beans
- Red onion
- Broccoli
- Soy milk

Surprisingly Low on the List

- Extra-virgin olive oil
- Pumpkin
- Roasted peanuts

In another study published in *BMC Genomics* in 2010,<sup>6</sup> researchers showed that consuming a diet rich in the phenolic components of virgin olive oil repressed several pro-inflammatory genes, and was associated with reduced risk of cardiovascular disease. In this study, Francisco Perez-Jimenez and his team studied the effects of eating a breakfast rich in phenol compounds on gene expression in 20 patients with metabolic syndrome (a precursor to type 2 diabetes). The study participants ate controlled breakfasts, and for six weeks before the study avoided all drugs, vitamin tablets and other supplements.

In their assessment of 98 genes, researchers showed that the polyphenol-enriched diet (with virgin olive oil) switched the activity of immune system cells to a less deleterious inflammatory profile, as is often seen in cases of metabolic syndrome. According to Perez-Jimenez, "These findings strengthen the relationship between inflammation, obesity and diet and provide evidence at the most basic level of healthy effects derived from virgin olive oil consumption in humans."<sup>6</sup>

It's important to remember that olive oil and tree nuts are also rich sources of the monounsaturated fat known as oleic acid. Monounsaturated fat consumption has been associated

with decreased LDL and possibly increased HDL cholesterol (HDL cholesterol reverses atherosclerosis). However, its ability to raise HDL is still debated.

Oleic acid may be responsible for the blood pressure-lowering effects of olive oil. As such, oleic acid may also play a role in reducing the risk of cardiovascular disease in individuals who frequently use olive oil, tree nuts or other good sources of monounsaturated fats (e.g., avocados).<sup>7-8</sup> However, the current evidence appears to suggest that the best advice is to use virgin olive oil rich in polyphenolic content and/or tree nuts (also rich in oleic acid and polyphenols) as an important part of cardiovascular disease prevention.<sup>1-6</sup>

### Richest Food Sources of Polyphenols

If ingesting polyphenols is a key factor in the prevention of heart disease and possibly cancer, then health practitioners and consumers should have a working knowledge of where to find the richest sources of polyphenols from food. A review published in the *European Journal of Clinical Nutrition* in 2010 provided a comprehensive listing in this regard.<sup>9</sup> After compiling a polyphenol database containing 452 foods and 502 different types of polyphenols, the researchers ranked foods based on their total amount of polyphenols per serving. The table above represents their key findings.

### References

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