

WALNUTS & HEART HEALTH

SINCE 1993, published research has been investigating how eating walnuts affects various heart health biomarkers and risk markers including:

- LDL and HDL cholesterol
- Apolipoprotein B and non-HDL cholesterol
- Blood pressure
- Inflammation
- Endothelial function
- Plaque formation

WALNUTS ARE CERTIFIED BY THE AMERICAN HEART ASSOCIATION WITH THE HEART-CHECK MARK



PER 1 OZ. SERVING

Please note that the Heart-Check Food Certification does not apply to scientific research by an organization other than the AHA unless expressly stated. For more information, see the AHA nutrition guidelines at: heartcheckmark.org/guidelines.

A two-year parallel group randomized controlled clinical trial explored the effects of a walnut-enriched diet on overall cholesterol in 708 cognitively healthy elders (63 -79 years old) without major comorbidities residing in Barcelona, Spain and Loma Linda, California.¹ Participants were allocated either a walnut-free or walnut-supplemented diet (=15% of energy, 30 - 60 grams/day) and had the options to eat a variety of other foods in addition to walnuts. Researchers went beyond LDL cholesterol and looked at all types of lipoproteins to better assess participants' cardiovascular disease risk. One ½ cup serving of walnuts a day made a positive effect on lipoproteins, including a reduction in the number of total LDL particles by 4.3% and small LDL particles by 6.1% as well as a decrease in Intermediate Density Lipoprotein (IDL) cholesterol, a subclass of lipoproteins that can negatively affect your risk for heart disease, by 16.9%. These changes may be associated with a lower risk of cardiovascular disease. This study is part of the Walnuts and Healthy Aging (WAHA) study, carried out in two centers - Loma Linda University, California, USA (LLU) and Hospital Clínic, Barcelona, Spain (BCN).² WAHA is the largest and longest nut trial to date, overcoming the limitations of prior smaller and shorter nut studies.

A clinical trial revealed there may be a connection between heart and gut health aided by consumption of walnuts.³ Findings showed that consuming walnuts enriched certain gut bacteria associated with improvements in blood pressure and cholesterol. Overweight and obese adults at risk for heart disease (42 in total) followed a diet that replaced some saturated fat with either walnuts, a vegetable oil with the same fatty acids as walnuts (including omega-3



Ricotta, Banana, Walnut, and Honey Toast



ALA, a type of polyunsaturated fat), or a vegetable oil higher in monounsaturated fat. Individuals who consumed walnuts and the vegetable oil with the same fatty acid profile as walnuts had favorable shifts in gut bacteria, suggesting a positive impact of omega-3 ALA. Those who followed the walnut diet had a unique enrichment of a particular species of bacteria – one that plays an important role in metabolizing ellagitannins, a bioactive component of walnuts that may be associated with cardiovascular benefits.

The types of fatty acids in walnuts and vegetable oil may impact gut health, but this study also suggests there may be benefits to consuming whole walnuts. It should be noted that the amount of walnuts consumed in this study might be difficult to maintain in a non-research setting. Larger and longer-term studies, as well as studies in more diverse populations, are needed to clarify population-wide effects, especially in gut health studies since the microbiome can be highly variable among individuals.

A systematic review and meta-analysis from the Harvard T.H. Chan School of Public Health examined 25 years of evidence for the role of walnut consumption on cardiovascular risk factors, including cholesterol, triglycerides, blood pressure and weight.⁴ A meta-analysis was done on 26 randomized controlled trials representing 1059 individuals (ages 22 - 75), including those with a variety of conditions such as high cholesterol, type 2 diabetes, metabolic syndrome, overweight or obesity, as well as those that were healthy. A diet supplemented with walnuts in amounts varying from 5 - 24% of total calories per day (equivalent to 0.5 - 3.9 ounces per day) showed a significantly greater reduction in total cholesterol on average with the walnut-enriched diets – specifically, this difference represents a 3.25% greater decrease in total cholesterol concentration in walnut-enriched diets compared with control diets. Greater reductions were also observed for LDL cholesterol (3.73%), triglycerides (5.52%) and apolipoprotein B (4.19%) when compared to the control diets, including low-fat, Mediterranean, American or Japanese. In addition, incorporating walnuts into the diet had no adverse effects on body weight or blood pressure, according to the studies included in the meta-analysis. A meta-analysis offers a comprehensive look at findings among patients of various backgrounds, however, it can be limited by the methods, reported outcomes and quality of the individual studies involved.

In a separate epidemiological study by researchers from the Harvard T.H. Chan School of Public Health, they found higher walnut consumption – both in terms of the amount and frequency – may be associated with lower risk of death and an increase in life expectancy among older adults in the U.S., compared to those who do not consume walnuts.⁵ Study participants included over 67,000 women of the Nurses' Health Study (1999 - 2018) and some 26,000 men of the Health Professionals Follow-up Study (1999 - 2018) who had their dietary assessment taken via a self-reported food frequency questionnaire. Both groups were on average around 63 years old and free of cancer, heart disease and stroke at baseline. Researchers found that participants who reported eating five or more servings of walnuts per week (one serving = one ounce) had a 14% lower risk of death (from any cause), 25% lower risk of dying from cardiovascular diseases and a gain in about 1.3 years of life expectancy, compared to participants who reported no walnut consumption. Results from the prospective observational study do not prove cause and effect, but it does shed light on how walnuts may support an overall healthy lifestyle that promotes longevity. Future research is needed to confirm the longevity benefits of eating walnuts in more diverse groups of individuals and these results cannot be applied to the general population.

Research from the landmark Prevención con Dieta Mediterránea (PREDIMED) study further demonstrated the potential heart health benefits of walnuts.⁶ The study was conducted among more than 7,000 Spanish individuals (ages 55 - 80) at high risk for cardiovascular disease and found that a Mediterranean diet supplemented with mixed tree nuts (primarily walnuts) was associated with a lower risk of cardiovascular events, including cardiovascular death, myocardial infarction (heart attack) and stroke, when compared to a low-fat control diet. It is important to note that the amount of walnuts the participants in this study ate was relatively large and might be tough to be consistent within a real-world setting.

In the PREDIMED study, it is also difficult to precisely define what part of the Mediterranean diet was associated with cardiovascular benefits.

Due to the evidence supporting the cardiovascular benefits of walnuts, the U.S. Food and Drug Administration approved one of the first qualified health claims for a whole food in March of 2004: "Supportive but not conclusive research shows that eating 1.5 ounces of walnuts per day as part of a low saturated fat and low cholesterol diet, and not resulting in the increased caloric intake, may reduce the risk of coronary heart disease."

⁴Rajaram S, Cofán M, Sala-Vila A, et al. Effects of walnut consumption for 2 years of lipoprotein subclasses among healthy elders: Findings from the WAHA randomized controlled trial. *Circulation*. 2021;144:1083-1085. ⁵Rajaram S, Vallis-Pedret C, Coffan M, et al. The Walnuts and Healthy Aging Study (WAHA): Protocol for a Nutritional Intervention Trial with Walnuts on Brain Aging. *Front Aging Neurosci*. 2017;8(333):1-12. ⁶Tindall AM, McLimans CJ, Petersen KS, et al. Walnuts and vegetable oils containing oleic acid differentially affect the gut microbiota and associations with cardiovascular risk factors: Follow-up of a randomized, controlled, feeding trial in adults at risk for cardiovascular disease. *J Nutr*. 2020;150(4):906-917. ⁷Gausch-Ferré M, Li J, Hu FB, et al. Effects of walnut consumption on blood lipids and other cardiovascular risk factors: An updated meta-analysis and systematic review of controlled trials. *Am J Clin Nutr*. 2018;108(1):174-187. ⁸Liu X, Gausch-Ferré M, Tobias DK, Li Y. Association of walnut consumption with total and cause-specific mortality and life expectancy in U.S. adults. *Nutrients*. 2021;13(8):2699. ⁹Estruch R, Ros E, Salas-Salvado JM, et al. Primary prevention of cardiovascular disease with a Mediterranean diet supplemented with extra-virgin olive oil or nuts. *N Engl J Med*. 2018;378(35):e34. ¹⁰One ounce of walnuts provides 18g of total fat, 2.5g of monounsaturated fat, 13g of polyunsaturated fat, including 2.5g of alpha-linolenic acid, the plant-based omega-3.