

The Latest Science on the Many Health Benefits of Tree Nuts

Penny Kris-Etherton, PhD, RD, FAHA

1. 2015 Dietary Guidelines Advisory Committee. DGAC Meeting 7: Materials and Presentations. <http://www.health.gov/dietaryguidelines/2015-binder/meeting7/index.aspx>. December 15, 2014.
2. Berryman CE, Greiger JA, West SG, et al. Acute consumption of walnuts and walnut components differentially affect postprandial lipemia, endothelial function, oxidative stress, and cholesterol efflux in humans with mild hypercholesterolemia. *J Nutr.* 2013;143(6):788-794.
3. Berryman CE, West SG, Fleming JA, Bordi PL, Kris-Etherton PM. Effects of daily almond consumption on cardiometabolic risk and abdominal adiposity in healthy adults with elevated LDL-cholesterol: a randomized controlled trial. *J Am Heart Assoc.* 2015;4(1):e000993.
4. Cohen J. Health Metrics. A controversial close-up of humanity's health. *Science.* 2012;338 (6613):1414-1416.
5. Doménech M, Roman P, Lapetra J, et al. Mediterranean diet reduces 24-hour ambulatory blood pressure, blood glucose, and lipids: one-year randomized, clinical trial. *Hypertension.* 2014;64(1):69-76.
6. Estruch R, Ros E, Salas-Salvadó J, et al. Primary prevention of cardiovascular disease with a Mediterranean diet. *N Engl J Med.* 2013;368(14):1279-1290.
7. Gebauer SK, West SG, Kay CD, Alaupovic P, Bagshaw D, Kris-Etherton PM. Effects of pistachios on cardiovascular disease risk factors and potential mechanisms of action: a dose-response study. *Am J Clin Nutr.* 2008;88(3):651-659.
8. Guasch-Ferré M, Hu FB, Martínez-González MA, et al. Olive oil intake and risk of cardiovascular disease and mortality in the PREDIMED Study. *BMC Med.* 2014;12:78.
9. Holligan SD, West SG, Gebauer SK, Kay CD, Kris-Etherton PM. A moderate-fat diet containing pistachios improves emerging markers of cardiometabolic syndrome in healthy adults with elevated LDL levels. *Br J Nutr.* 2014;112(5):744-752.
10. Ibarrola-Jurado N, Bulló M, Guasch-Ferré M, et al. Cross-sectional assessment of nut consumption and obesity, metabolic syndrome and other cardiometabolic risk factors: the PREDIMED Study. *PLoS One.* 2013;8(1):e57367.
11. Luu HN, Blot WJ, Xiang YB, et al. Prospective Evaluation of the Association of Nut/Peanut Consumption With Total and Cause-Specific Mortality. *JAMA Intern Med.* 2015; doi:10.1001/jamainternmed.2014.8347.

12. Lloyd-Jones DM, Hong Y, Labarthe D, et al. Defining and setting national goals for cardiovascular health promotion and disease reduction: the American Heart Association's strategic Impact Goal through 2020 and beyond. *Circulation*. 2010;121(4):586-613.
13. Martínez-González MÁ, Toledo E, Arós F, et al. Extravirgin olive oil consumption reduces risk of atrial fibrillation: the PREDIMED trial. *Circulation*. 2014;130(1):18-26.
14. Martínez-Lapiscina EH, Clavero P, Toledo E, et al. Mediterranean diet improves cognition: the PREDIMED-NAVARRA randomised trial. *J Neurol Neurosurg Psychiatry*. 2013;84(12):1318-1325.
15. Nguyen SV, Nakamura T, Kugiyama K. High remnant lipoprotein predicts recurrent cardiovascular events on statin treatment after acute coronary syndrome. *Circ J*. 2014;78(10):2492-2500.
16. Pan A, Sun Q, Manson JE, Willett WC, Hu FB. Walnut consumption is associated with lower risk of type 2 diabetes in women. *J Nutr*. 2013;143(4):512-518.
17. Rohatgi A, Khera A, Berry J, et al. HDL cholesterol efflux capacity and incident cardiovascular events. *N Engl J Med*. 2014;371:2383-2393.
18. Ros E, Núñez I, Pérez-Heras A, et al. A walnut diet improves endothelial function in hypercholesterolemic subjects: a randomized crossover trial. *Circulation*. 2004;109(13):1609-1614.
19. Sabaté J, Ang Y. Nuts and health outcomes: new epidemiologic evidence. *Am J Clin Nutr*. 2009;89(5):1643s-1648s.
20. Sabaté J, Oda K, Ros E. Nut consumption and blood lipid levels: a pooled analysis of 25 intervention trials. *Arch Intern Med*. 2010;170(9):821-827.
21. Salas-Salvadó J, Bulló M, Babio N, et al. Reduction in the incidence of type 2 diabetes with the Mediterranean diet: Results of the PREDIMED-Reus nutrition intervention randomized trial. *Diabetes Care*. 2011;34(1):14-19.
22. Sala-Vila A, Romero-Mamani ES, Gilabert R, et al. Changes in ultrasound-assessed carotid intima-media thickness and plaque with a Mediterranean diet: a substudy of the PREDIMED trial. *Arterioscler Thromb Vasc Biol*. 2014;34(2):439-445.
23. Sauder KA, McCrea CE, Ulbrecht JS, Kris-Etherton PM, West SG. Pistachio nut consumption modifies systemic hemodynamics, increases heart rate variability, and reduces ambulatory blood pressure in well-controlled type 2 diabetes: a randomized trial. *J Am Heart Assoc*. 2014;3(4):e000873.
24. Toledo E, Hu FB, Estruch R, et al. Effect of the Mediterranean diet on blood pressure in the PREDIMED trial: results from a randomized controlled trial. *BMC Med*. 2013;11:207.

25. Turner JR, Viera AJ, Shimbo D. Ambulatory blood pressure monitoring in clinical practice: a review. *Am J Med.* 2015;128(1):14-20.
26. US Department of Agriculture, US Department of Health and Human Services. *Report of the Dietary Guidelines Advisory Committee on the Dietary Guidelines for Americans, 2010.* US Department of Agriculture; 2010.
27. US Department of Agriculture, US Department of Health and Human Services. *Dietary Guidelines for Americans, 2010.* 7th ed. Washington, DC: US Government Printing Office; 2010.
28. US Department of Agriculture. *Scientific Report of the 2015 Dietary Guidelines Advisory Committee.* US Department of Agriculture; 2015.
29. West SG, Krick AL, Klein LC, et al. Effects of diets high in walnuts and flax oil on hemodynamic responses to stress and vascular endothelial function. *J Am Coll Nutr.* 2010;29(6):595-603.
30. Zhao G, Etherton TD, Martin KR, West SG, Gillies PJ, Kris-Etherton PM. Dietary alpha-linolenic acid reduces inflammatory and lipid cardiovascular risk factors in hypercholesterolemic men and women. *J Nutr.* 2004;134(11):2991-2997.

Richard D. Mattes, MPH, PhD, RD

1. Albert CM, Gaziano JM, Willett WC, Manson JE. Nut consumption and decreased risk of sudden cardiac death in the Physicians' Health Study. *Arch Intern Med.* 2002;162(12):1382-1387.
2. Baer DJ, Gebauer SK, Novotny JA. Measured energy value of pistachios in the human diet. *Br J Nutr.* 2012;107(1):120-125.
3. Cassady BA, Hollis JH, Fulford AD, Considine RV, Mattes RD. Mastication of almonds: effects of lipid bioaccessibility, appetite, and hormone response. *Am J Clin Nutr.* 2009;89(3):794-800.
4. Ellis PR, Kendall CW, Ren Y, et al. Role of cell walls in the bioaccessibility of lipids in almond seeds. *Am J Clin Nutr.* 2004;80(3):604-613.
5. Hollis J, Mattes R. Effect of chronic consumption of almonds on body weight in healthy humans. *Br J Nutr.* 2007;98(3):651-656.
6. Hu FB, Stampfer MJ, Manson JE, et al. Frequent nut consumption and risk of coronary heart disease in women: prospective cohort study. *BMJ.* 1998;317(7169):1341-1345.

7. Hull S, Re R, Chambers L, Echaniz A, Wickham MS. A mid-morning snack of almonds generates satiety and appropriate adjustment of subsequent food intake in healthy women [published online September 3, 2014]. *Eur J Nutr.* doi: 10.1007/s00394-014-0759-z.
8. Kendall CWC, Jenkins DJA, Marchie A, Ren YL, Ellis PR, Lapsley KG. Energy availability from almonds: implications for weight loss and cardiovascular health. A randomized controlled dose-response trial. *FASEB J.* 2003;17(4):A339.
9. Novotny JA, Gebauer SK, Baer DJ. Discrepancy between the Atwater factor predicted and empirically measured energy values of almonds in human diets. *Am J Clin Nutr.* 2012;96(2):296-301.
10. Tan SY, Mattes RD. Appetitive, dietary and health effects of almonds consumed with meals or as snacks: a randomized, controlled trial. *Eur J Clin Nutr.* 2013;67(11):1205-1214.
11. Traore CJ, Lokko P, Cruz AC, et al. Peanut digestion and energy balance. *Int J Obes (Lond).* 2008;32(2):322-328.

Sharon Palmer, RDN

1. Bolling BW, Chen CY, McKay DL, Blumberg JB. Tree nut phytochemicals: composition, antioxidant capacity, bioactivity, impact factors. A systematic review of almonds, Brazils, cashews, hazelnuts, macadamias, pecans, pine nuts, pistachios and walnuts. *Nutr Rev.* 2011;24(2):244-275.
2. Chen CY, Blumberg JB. Phytochemical composition of nuts. *Asia Pac J Clin Nutr.* 2008;17 (Suppl 1):329-332.
3. Functional foods fact sheet: plant stanols and sterols. International Food Information Council Foundation website.
http://www.foodinsight.org/Functional_Foods_Fact_Sheet_Plant_Stanols_and_Sterols. Updated November 7, 2014. Accessed March 3, 2015.
4. Ros E. Health benefits of nut consumption. *Nutrients.* 2010;2(7):652-682.
5. United States Department of Agriculture. National Nutrient Database for Standard Reference, Release 27. <http://ndb.nal.usda.gov/ndb/search/list>. Accessed February 12, 2015.
6. Summary of Qualified Health Claims Subject to Enforcement Discretion. US Food and Drug Administration website.
<http://www.fda.gov/Food/IngredientsPackagingLabeling/LabelingNutrition/ucm073992.htm#cardio>. Updated December 14, 2014. Accessed March 3, 2015.