



Avocado is a delicious and versatile prescription for better heart health. Enjoying avocado daily is a good way to improve risk factors such as high blood lipids and blood pressure and helps to achieve a cardioprotective eating pattern.

HEART-HEALTHY NUTRIENTS IN AVOCADOS

Avocados provide a helpful collection of nutrients and phytochemicals important for heart health.

**AVOCADO = GOOD FATS + FOLATE + PHYTOCHEMICALS +
FIBRE + VITAMINS + MINERALS**

- ✓ mostly unsaturated fats and no trans fats
- ✓ naturally low in sodium and sugars
- ✓ dietary fibre, including soluble fibre
- ✓ potassium
- ✓ folate
- ✓ antioxidant vitamins C and E
- ✓ polyphenol antioxidants
- ✓ colourful antioxidant carotenoids - beta carotene, cryptoxanthin, lutein and zeaxanthin

With all these nutritional goodies it's no wonder the Australian Dietary Guidelines recommend swapping foods high in saturated fats, such as butter, for foods with mostly unsaturated fats such as avocado.

HOW AVOCADOS HELP THE HEART

Blood lipids: A diet with a mostly unsaturated fatty acid profile,¹ combined with plenty of fibre - including soluble fibre² - can optimise blood lipids. Avocados contain monounsaturated fat and soluble fibre and improve lipid profiles in human intervention studies.³

The addition of 75-300g of avocado to a variety of healthy diets has been shown to lower total and LDL cholesterol while maintaining HDL cholesterol. These benefits have been observed in participants with a range of health profiles^{4,5,6,7,8,9,10,11}

Blood pressure: The DASH diet (Dietary Approaches to Stop Hypertension) offers a good evidence-based approach to the management of high blood pressure. Including at least 2 serves of fruit and 5 serves of vegetables a day and limiting sodium (salt) can lower blood pressure. Avocados help meet the 2 & 5 target and are naturally low in sodium.

Body fat: Diets with monounsaturated fats from plant sources are associated with less weight gain over time.¹² Avocado with a meal has been shown to increase perceived post-meal satiety^{13,14} and better satiety makes a restricted-kilojoule diet easier to sustain over time.

Inflammation: Chronic, low-level metabolic inflammation (also coined *metaflammation*) is a contributor to metabolic disease and nutrition strategies can help.¹⁵ Generally saturated fats are pro-inflammatory while unsaturated fats are anti-inflammatory.¹⁶ Avocados have unsaturated fats plus the bonus of anti-inflammatory¹⁷ phytochemicals. And avocados also reduce oxidative stress,¹⁸ another contributor to cardiovascular disease.

LATEST RESEARCH ON AVOCADOS

Reviews

Studies on avocado published over the past five years reaffirm their health benefits, especially for cardiovascular health. In particular, two systematic reviews and meta-analyses demonstrate helpful effects for lipid management. The first by Peou¹⁹ and colleagues found avocado lowered total cholesterol, LDL cholesterol and triglycerides. A second by Mahmassani and colleagues²⁰ found avocado increased 'good' HDL cholesterol.

More generally, a review paper²¹ describes how fruits - such as avocado (botanically a fruit) - can help in the prevention and treatment of cardiovascular disease via a variety of mechanisms.

New intervention studies

A study in overweight and obese adults²² showed a moderate fat, cholesterol-lowering diet with one avocado a day had additional effects on lipoproteins compared to a matched moderate fat diet with no avocado. The avocado was especially effective at reducing the atherogenic small, dense LDL particles. Positive metabolic effects of avocado in the post-prandial period have also been described.²³ Substituting some carbohydrate with avocado in overweight and obese subjects reduced glycemic and insulin responses, improved endothelial function, reduced triglyceride rich lipoproteins and increased HDL compared to a control meal.

Epidemiological studies

In an analysis of the large US NHANES (National Health and Nutrition Examination Survey) cohort, consumers of avocado were found to have a fifty percent lower risk of metabolic syndrome²⁴ than non-consumers, as well as higher HDL cholesterol levels and higher diet quality.

An investigation²⁵ by the Harvard group using data from the Nurses Health and Health Professional Follow Up studies found monounsaturated fats from plant sources, such as those found in avocados, were associated with a reduced risk of cardiovascular disease. The risk reduction was 19% when monounsaturated fats from plants were used to replace saturated fats and monounsaturated fats from animal sources.

These latest studies confirm the value of avocado in cardio-protective eating patterns in both healthy weight and overweight people

EVERYBODY LOVES AVOS

Another great thing about avocados are they on the 'include' list for all the popular diets. Whether it's the Mediterranean diet, DASH, low-carb, paleo, plant-based or vegan, avocados get a big tick. While avocado may not be the cheapest fruit, it does contain 4 x 50g serves per piece. Avocado is nutrient dense and offers excellent nutritional value for money.

AVOCADO FOR A HEALTHY HEART; A DELICIOUS PRESCRIPTION

Avocado is a good choice at any time of the day. For maximum benefit, enjoy avo with other cardio-protective foods such as wholegrains, legumes, nuts, seeds and seafood.

6 WAYS TO ENJOY AVOCADO IN HEART-FRIENDLY MEALS

1. Smashed avo on wholegrain toast – try a poached egg or smoked salmon on top.
2. Avocado in sandwiches, wraps and burgers– choose wholegrain bread, and plenty of vegetables, plus some seafood (eg tuna, salmon or prawns), egg or legumes (white beans, tofu or hummus).
3. Rice and noodle bowls with avocado - use brown rice and wholegrain/wholemeal noodles, different coloured veggies, legumes (eg lentils, black beans), nuts (eg almonds, cashews or pistachios) and seeds (sunflower, pumpkin or chia), plus some egg, seafood or chicken.
4. Salads with avocado such as green salad, pasta salad or salad with lean meat or seafood (eg prawn and avocado salad).
5. Guacamole or avocado salsa with lean meat, chicken, seafood, eggs, beans or vege-burgers.
6. Avocado in shakes and smoothies and better-for-you sweet treats such as chocolate mousse (yes really, try it!).

Check out more delicious recipes at australianavocados.com.au



NUTRITION INFORMATION

Servings per package: 4 serves per avocado
 Serving size: 50g or ¼ avocado

	Average Quantity per Serving	Average Quantity per 100g
Energy	430kJ (102Cal)	860kJ (205Cal)
Protein, total	1.0g	2.0g
Fat, total	10.7g	21.4g
– saturated	2.4g	4.8g
– trans	0g	0g
– polyunsaturated	1.4g	2.7g
– monounsaturated	7.4g	12.8g
Carbohydrate	<1g	<1g
– sugars	<1g	<1g
Dietary fibre, total	2.5g	5.0g
Dietary fibre, soluble (26)	1g	2g
Sodium	2mg	4mg
Potassium	255mg	509mg
Folate	30ug DFE (15% RDI)	59ug DFE
Vitamin C	5.5mg (14% RDI)	11mg
Vitamin E	1mg (10% RDI)	2mg
Polyphenols	71mg GAE	142mg GAE
Beta carotene	14ug	27ug
Cryptoxanthin	59ug	117ug
Lutein & zeaxanthin	136ug	271ug

REFERENCES

- Martin N et al. Reduction in saturated fat intake for cardiovascular disease. *Cochrane Database Syst Rev*. 2015 Jun 10;6:CD011737. doi: 10.1002/14651858.CD011737. <https://www.ncbi.nlm.nih.gov/pubmed/26068959>
- Brown L et al. Cholesterol-lowering effects of dietary fiber: a meta-analysis. *Am J Clin Nutr*. 1999 Jan;69(1):30-42. <https://www.ncbi.nlm.nih.gov/pubmed/9925120>
- Peou S et al. Impact of avocado-enriched diets on plasma lipoproteins: A meta-analysis. *J Clin Lipidol*. 2016 Jan-Feb;10(1):161-71. doi: 10.1016/j.jacl.2015.10.011. <https://www.ncbi.nlm.nih.gov/pubmed/26892133>
- Grant, W. C. Influence of avocados on serum cholesterol. *Proc. Soc. Exp. Biol. Med.* 1960;104:45-47. <https://journals.sagepub.com/doi/abs/10.3181/00379727-104-25722?journalCode=ebma>
- Colquhoun DM et al. Comparison of the effects on lipoproteins and apolipoproteins of a diet high in monounsaturated fatty acids, enriched with avocado, and a high-carbohydrate diet. *Am J Clin Nutr*. 1992 Oct;56(4):671-7. <https://academic.oup.com/ajcn/article/56/4/671/4715560>
- Alvizouri-Muñoz M et al. Effects of avocado as a source of monounsaturated fatty acids on plasma lipid levels. *Arch Med Res*. 1992 Winter;23(4):163-7. Available at <https://www.ncbi.nlm.nih.gov/pubmed/1308699>
- Lerman-Garber I et al. Effect of a high-monounsaturated fat diet enriched with avocado in NIDDM patients. *Diabetes Care*. 1994 Apr;17(4):311-5. Available from <https://www.ncbi.nlm.nih.gov/pubmed/8026287>
- Carranza J et al. Effects of avocado on the level of blood lipids in patients with phenotype II and IV dyslipidemias. *Arch Inst Cardiol Mex*. 1995 Jul-Aug;65(4):342-8. Available from <https://www.ncbi.nlm.nih.gov/pubmed/8561655>
- López Ledesma R et al. Monounsaturated fatty acid (avocado) rich diet for mild hypercholesterolemia. *Arch Med Res*. 1996;27(4):519-23. Available at <https://www.ncbi.nlm.nih.gov/pubmed/8987188>
- Carranza-Madrigal J et al. Effects of a vegetarian diet vs. a vegetarian diet enriched with avocado in hypercholesterolemic patients. *Arch Med Res*. 1997 Winter;28(4):537-41. <https://www.ncbi.nlm.nih.gov/pubmed/9428580>
- Wang L, et al, Effect of a moderate fat diet with and without avocados on lipoprotein particle number, size and subclasses in overweight and obese adults: a randomized, controlled trial. *J Am Heart Assoc*. 2015 Jan 7;4(1). pii: e001355. doi: 10.1161/JAHA.114.001355. <https://www.ncbi.nlm.nih.gov/pubmed/25567051>
- Li Y et al.. Changes in Types of Dietary Fats Influence Long-term Weight Change in US Women and Men. *J Nutr*. 2018 Nov 1;148(11):1821-1829. doi: 10.1093/jn/nxy183. <https://www.ncbi.nlm.nih.gov/pubmed/30247611>
- Wien M et al. A randomized 3x3 crossover study to evaluate the effect of Hass avocado intake on post-ingestive satiety, glucose and insulin levels, and subsequent energy intake in overweight adults. *Nutr J*. 2013 Nov 27;12:155 <https://www.ncbi.nlm.nih.gov/pubmed/24279738>
- Haddad E et al. Postprandial gut hormone responses to Hass avocado meals and their association with visual analog scores in overweight adults: A randomized 3 × 3 crossover trial. *Eat Behav*. 2018 Dec;31:35-40. doi: 10.1016/j.eatbeh.2018.08.001. <https://www.ncbi.nlm.nih.gov/pubmed/30096700>
- Botchleff R et al. Nutritional approaches for managing obesity-associated metabolic diseases. *J Endocrinol*. 2017;233(3):R145-R171. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5511693/>
- Rocha DM et al. The role of dietary fatty acid intake in inflammatory gene expression: a critical review. *Sao Paulo Med J*. 2017 Mar-Apr;135(2):157-168. doi: 10.1590/1516-3180.2016.008607072016. <https://www.ncbi.nlm.nih.gov/pubmed/28076613>
- Li Z et al. Hass avocado modulates postprandial vascular reactivity and postprandial inflammatory responses to a hamburger meal in healthy volunteers. *Food Funct*. 2013 Feb 26;4(3):384-91. doi: 10.1039/c2fo30226h. <https://www.ncbi.nlm.nih.gov/pubmed/23196671>
- Khor A et al. Postprandial oxidative stress is increased after a phytonutrient-poor food but not after a kilojoule-matched phytonutrient-rich food. *Nutr Res*. 2014 May;34(5):391-400. <https://www.ncbi.nlm.nih.gov/pubmed/24916552>
- Peou S et al. Impact of avocado-enriched diets on plasma lipoproteins: A meta-analysis. *J Clin Lipidol*. 2016 Jan-Feb;10(1):161-71 <https://www.ncbi.nlm.nih.gov/pubmed/26892133>
- Mahmassani HA et al.. Avocado consumption and risk factors for heart disease: a systematic review and meta-analysis. *Am J Clin Nutr*. 2018 Apr 1;107(4):523-536 <https://www.ncbi.nlm.nih.gov/pubmed/29635493>
- Zhao CN et al. Fruits for Prevention and Treatment of Cardiovascular Diseases. *Nutrients*. 2017 Jun 13;9(6). <https://www.ncbi.nlm.nih.gov/pubmed/28608832>
- Wang L et al. Effect of a moderate fat diet with and without avocados on lipoprotein particle number, size and subclasses in overweight and obese adults: a randomized, controlled trial. *J Am Heart Assoc*. 2015 Jan 7;4(1) <https://www.ncbi.nlm.nih.gov/pubmed/25567051>
- Park E et al. Avocado Fruit on Postprandial Markers of Cardio-Metabolic Risk: A Randomized Controlled Dose Response Trial in Overweight and Obese Men and Women. *Nutrients*. 2018 Sep 12;10(9). <https://www.ncbi.nlm.nih.gov/pubmed/30213052>
- Fulgoni VL 3rd, et al. Avocado consumption is associated with better diet quality and nutrient intake, and lower metabolic syndrome risk in US adults: results from the National Health and Nutrition Examination Survey (NHANES) 2001-2008. *Nutr J*. 2013 Jan 2;12:1 <https://www.ncbi.nlm.nih.gov/pubmed/23282226>
- Zong G et al. Monounsaturated fats from plant and animal sources in relation to risk of coronary heart disease among US men and women. *Am J Clin Nutr*. 2018 Mar 1;107(3):445-453 <https://www.ncbi.nlm.nih.gov/pubmed/29566185>
- Li BW et al Individual Sugars, Soluble, and Insoluble Dietary Fiber Contents of 70 High Consumption Foods *J Food Comp Anal* 2002(15):715-723 <https://www.ncbi.nlm.nih.gov/pubmed/19255919>