A FACTSHEET FOR HEALTHCARE PROFESSIONALS

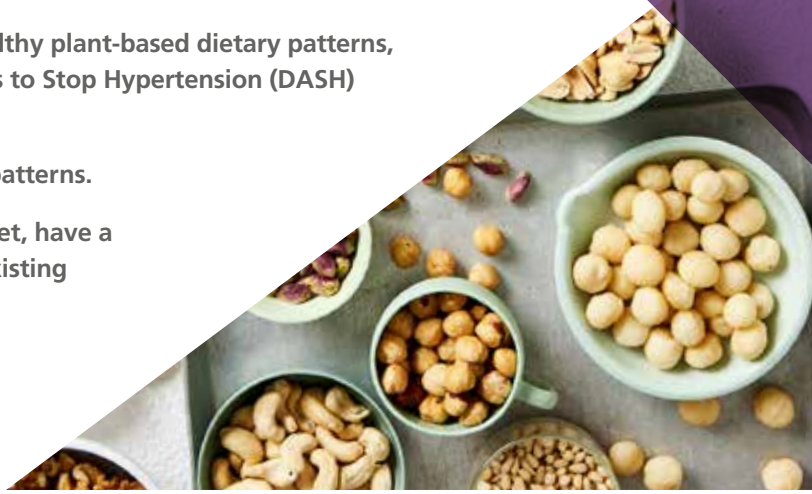
Nuts and Diabetes

Almost 1.9 million Australians have diabetes [1]. Type 2 diabetes, which is largely preventable, accounts for 85–90% of all cases – and is increasing each year.

Current diabetes guidelines, across the world, promote healthy plant-based dietary patterns, such as the Mediterranean diet and the Dietary Approaches to Stop Hypertension (DASH) diet, for managing type 2 diabetes [2,3].

Nuts are encouraged within each of these healthy dietary patterns.

Research suggests that nuts, within a healthy and varied diet, have a potential role in preventing type 2 diabetes [4], managing existing diabetes [5], and preventing or reducing the progression of diabetes-related complications [5,6].



What the research says

Overall, more studies are needed to better understand the impact of nuts on preventing and managing type 2 diabetes [7]. But some research findings to date suggest that higher nut consumption may:

Lower the risk of type 2 diabetes

- Evidence from a systematic literature review (SLR) and meta-analysis of five prospective cohort studies and one randomised controlled trial (RCT), showed that consuming a handful (28g) of nuts four times a week was linked with a 13% reduction in the risk of type 2 diabetes [4].
- The PREDIMED trial found consuming more than three serves of nuts per week, within a Mediterranean dietary pattern, resulted in a 22% lower prevalence of diabetes, compared with consuming less than one serve per week [8].

Improve glycaemic control

- Acute studies show reductions in postprandial glucose levels, and long-term trials have found modest positive effects on blood glucose control (that is, reductions in fasting blood glucose, and HbA1c) [7].
  - For example, evidence from a SLR and meta-analysis of 12 RCTs showed that nuts significantly lowered HbA1c and fasting glucose (but not fasting insulin or HOMA-IR), compared to control diets, in people with type 2 diabetes [5].

Did you know?

People with diabetes are around 2–4 times more likely to die from cardiovascular disease (CVD) and are more likely to have abnormal blood lipids [9].

Reduce the risk of heart disease (a diabetes-related complication)

- Evidence from a SLR and meta-analysis of RCTs showed that regular nut consumption positively impacts a range of biomarkers of CVD risk (including total cholesterol, LDL cholesterol, and triglycerides), to create an overall CVD risk reduction [10].
- An umbrella review, of more than 145 SLRs and meta-analyses, found eating a handful (~30g) of nuts a day was associated with a 21% reduced risk for CVD, and a 22% reduced risk of dying from it, compared with not eating nuts [11].

Reduce the risk of diabetes mortality

- A SLR and meta-analysis of four prospective cohort studies, involving more than 200,000 people, found a 39% reduction in the relative risk of diabetes mortality with a one (~30g) serving per day increase in nut consumption [12].

Body weight and diabetes

Around 60–90% of types 2 diabetes is thought to be due to obesity or weight gain, and elevated weight can increase complications in people living with diabetes [7].

Despite being relatively energy dense, research shows nut consumption is not linked with weight gain, or an increased risk of overweight or obesity.

In fact, consistent evidence shows that regularly eating nuts reduces, not increases, adiposity measures – including body weight, body mass index (BMI), and waist circumference [13-15].

Most Australians are not eating enough nuts. Only 2% eat 30g of nuts a day, with the average (mean) intake just 4.6g per day [23].

Potential mechanisms of action

Nuts have a unique nutritional profile, containing many nutrients and bioactive compounds that benefit metabolic health.

Component of nuts	Mechanisms of action
Glycaemic Index (GI) lowering effect	Nuts contain low amounts of carbohydrate, so do not contribute significantly to postprandial glycaemia. And when eaten with carbohydrate-containing foods at a meal, they have a GI-lowering effect, due to their fat, protein, and fibre content [16].
Rich source of healthy fats	Nuts contain predominantly mono- and polyunsaturated fats, and are low in saturated fats. Replacing saturated and trans fats with unsaturated fats improves insulin sensitivity and reduces type 2 diabetes risk [17].
Good source of fibre	Diets high in fibre have been shown to help in managing diabetes and metabolic syndrome and can reduce the risk of developing diabetes [18-20].
Rich in vitamins and minerals	Nuts contain relatively high amounts of vitamin E, magnesium, and selenium, among other nutrients, which may impact the risk and management of diabetes. For instance, most nuts contain magnesium, which has been linked with improved glycaemic control [21,22].
Contain bioactive compounds	Nuts are made up of a matrix of important bioactive compounds, including polyphenols. Emerging research suggests polyphenols – which may act as prebiotics in the gut – may have a role in diabetes prevention and management [7].

What does all this mean?

The evidence to date suggests that higher nut consumption may help in reducing the risk of developing diabetes, as well as in managing existing diabetes. However, more research is needed to better understand the impact of nuts.

Health professionals can be confident that a daily 30g serve of nuts (around a handful) is an appropriate recommendation.

What your clients need to know

- Nuts are a nutrient-rich plant food.
- They are considered a core food within healthy dietary patterns [24].
- Eating a 30g serve of nuts a day is linked with many health benefits.
- Nuts may play an important role in helping to prevent and manage type 2 diabetes.

For good health, enjoy a healthy handful of nuts every day.

References

1. Diabetes Australia. Diabetes in Australia. Available at: https://www.diabetesaustralia.com.au/about-diabetes/diabetes-in-australia/
2. Lifestyle Management: Standards of Medical Care in Diabetes. *Diabetes Care,* 2019. 42: p. S46–S60.
3. Dyson, PA. et al. Diabetes UK Evidence-Based Nutrition Guidelines for the Prevention and Management of Diabetes. *Diabet Med,* 2018. 35: p. 541–7.
4. Afshin, A., et al. Consumption of nuts and legumes and risk of incident ischemic heart disease, stroke, and diabetes: A systematic review and meta-analysis. *Am J Clin Nutr*, 2014. 100(1): p. 278-88.
5. Viguiliouk, E., et al. Effect of tree nuts on glycemic control in diabetes: a systematic review and meta-analysis of randomized controlled dietary trials. *PLoS One*, 2014. 9(7): p. e103376.
6. Tindall, A., et al. The effect of nuts on markers of glycemic control: A systematic review and meta-analysis of randomized controlled trials. *Am J Clin Nutr,* 2019. 109(2): p. 297-314.
7. Nishi, SK., et al. Nuts in the prevention and management of Type 2 diabetes. *Nutrients,* 2023. 15: p. 878-900.
8. Ibarrola-Jurado, N., et al. Cross-sectional assessment of nut consumption and obesity, metabolic syndrome and other cardiometabolic risk factors: the PREDIMED study. *PLoS One*, 2013. 8(2): p. e57367.
9. Diabetes Australia. The Heart of the Matter. Available at: https://www.diabetesaustralia.com.au/blog/heart-disease/
10. Houston, L., et al. Tree nut and peanut consumption and risk of cardiovascular disease: A systematic review and meta-analysis of randomised controlled trials. *Adv Nutr,* 2023. 14(5): p. 1029-49.
11. Balakrishna, R., et al. Consumption of nuts and seeds and health outcomes including cardiovascular, diabetes and metabolic disease, cancer, and mortality: An umbrella review. *Adv Nutr,* 2022. 13(6): p. 2136-48.
12. Aune, D., et al. Nut consumption and risk of cardiovascular disease, total cancer, all-cause and cause-specific mortality: a systematic review and dose-response meta-analysis of prospective studies. *BMC Med*, 2016. 14(1): p. 207.
13. Nishi, SK., et al. Are fatty nuts a weighty concern? A systematic review and meta-analysis and dose–response meta-regression of prospective cohorts and randomized controlled trials. *Obes Rev,* 2021. (22(11): p. e13330.
14. Li, H., et al. Nut consumption and risk of metabolic syndrome and overweight/obesity: A meta-analysis of prospective cohort studies and randomized trials. *Nutr Metab* (Lond), 2018. 15: p. 46.
15. Flores-Mateo, G., et al. Nut intake and adiposity: Meta-analysis of clinical trials. *Am J Clin Nutr,* 2013. 97: p. 1346-55.
16. Kendall, CW., et al. The glycemic effect of nut-enriched meals in healthy and diabetic subjects. *Nutr Metab Cardiovasc Dis,* 2011. 21: Suppl 1: S34-9.
17. Imamura, F., et al. Effects of saturated fat, polyunsaturated fat, monounsaturated fat, and carbohydrate on glucose-insulin homeostasis: A systematic review and meta-analysis of randomised controlled feeding trials. *PLoS Med*, 2016. 13: p. e1002087.
18. Dikeman, CL., et al. Viscosity as related to dietary fiber: A review. *Crit Rev Food Sci Nutr,* 2006. 46: p. 649–63.
19. Tolhurst, G., et al. Short-chain fatty acids stimulate glucagon-like peptide-1 secretion via the G-protein-coupled receptor FFAR2. *Diabetes,* 2012. 61: p. 364–71.
20. Russell, WR., et al. Impact of diet composition on blood glucose regulation. *Crit Rev Food Sci Nutr*, 2016. 56: p. 541–90.
21. Dong, JY., et al. Magnesium intake and risk of type 2 diabetes: Meta-analysis of prospective cohort studies. *Diabetes Care,* 2011. 34(9): p. 2116-22.
22. Elderawi, WA., et al. The effects of oral magnesium supplementation on glycemic response among type 2 diabetes patients. *Nutrients*, 2019. 11: p. 44.
23. Nikodijevic, CJ., et al. Nut consumption in a representative survey of Australians: A secondary analysis of the 2011-2012 National Nutrition and Physical Activity Survey. *Public Health Nutr,* 2020. 23(18): p. 3368-78.
24. NHMRC. Eat for Health – Australian Dietary Guidelines. Providing the scientific evidence for healthier Australian diets. Available at: https://www.eatforhealth.gov.au/guidelines

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