

Review Article

A review of the evidence: nuts and body weight

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There is currently no single dietary or lifestyle intervention that is effective in long-term weight loss. Traditional weight loss diets tend to be low in total fat and therefore often restrict nut consumption. However, nuts are an important source of many vitamins, minerals, monounsaturated and polyunsaturated fatty acids. This paper reviewed all the available evidence from the literature in relation to nut consumption and body weight. The findings show that the role of nut consumption in body weight management is varied. Nuts, when included as part of an energy-controlled diet, were found in some instances to assist with weight loss. However, when nuts were added to an existing diet without controlling for energy intake, body weight increased, although to a lesser extent than theoretically predicted. There is limited evidence on the effect nut consumption has on type 2 diabetes, although available evidence indicates that nuts as part of a healthy diet do not cause weight gain and can have a positive influence on the fatty acid profile of a person with diabetes. This review shows there is a lack of evidence to support the restriction of nut consumption in weight management, indicating that further research is needed to assess the role of nuts in weight management.

Key Words: nuts, body weight, body mass index, weight loss, diabetes mellitus, Type 2

INTRODUCTION

Overweight and obesity are major public health concerns. Population health statistics show that obesity in Australia, and in other industrialised countries including the United Kingdom and the United States, is continuing to rise. In Australia 67% of males and 52% of females are overweight or obese, and the direct costs are estimated to be over \$840 million yearly.¹ There is currently no specific dietary or lifestyle intervention that is effective at reducing weight in the long term. Traditional prescriptions for weight loss include high carbohydrate, low-fat diets,¹ which often exclude or minimise food sources of unsaturated fatty acids like vegetable oils, avocados and nuts.² More recently, alternative approaches that include moderate protein intakes are receiving more attention for their role in weight management,³ however these diets still tend to restrict foods high in unsaturated fatty acids. People on weight loss diets and those aiming to prevent weight gain may avoid certain nutrient dense foods with the belief that those foods will contribute to weight gain.² Consumer research has shown that approximately 44% of Australian general practitioners recommend patients either avoid nuts or limit consumption to once a week if they are aiming to lose weight.⁴

However, nuts are a highly nutritious food that contain many useful vitamins, minerals and healthy monounsaturated and polyunsaturated fatty acids. In fact, nut consumers have been shown to have a nutrient intake consistent with recommendations to prevent chronic disease in both healthy adults,⁵ and in those with type 2 diabetes.⁶ Dietary patterns that include nuts, along with other healthy foods such as whole grains, reduced-fat dairy products and plant foods, are inversely related to body mass index (BMI).⁷ Nuts are also a source of dietary fibre⁸ and protein, two

factors that are known to increase the satiety of meals and prolong feelings of fullness following consumption.⁹ Choosing nutrient dense foods that can help manage hunger levels is particularly useful when trying to restrict food intake in order to reduce or control body weight.

While nuts are high in fat (ranging from 49% to 76% fat, with the exception of chestnuts which contain around 0.6% fat), which therefore contributes to energy intake, research indicates they may not limit a person's ability to lose weight.¹⁰ This literature review aims to identify and evaluate the available evidence that investigates the role of nut consumption in weight management, including an analysis of the quality of the available research.

METHODS

The methodology of this literature review, and a summary document, included a defined search strategy to identify relevant articles on Medline, Web of Science, and ProQuest. Hand searching of other relevant nutrition journals that are not indexed on Medline or other search engines was completed to ensure a comprehensive search. Studies from 1975 to February 2006 were considered for this review. The studies to be identified required participants to be aged 19 years and over, and had to include a dietary intervention that focused on providing tree nuts or peanuts. They also had to objectively measure weight loss, reported as mean weight loss, BMI, change in BMI or mean change in weight from baseline.

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Manuscript received 22 December 2006. Initial review completed 14 April 2007. Revision accepted 25 May 2007.

Articles were rejected on initial screening if the reviewer determined from the title or abstract that the article was not a randomised controlled trial, a longitudinal observational study, did not address an intervention focusing on nut consumption, or did not report body weight measures. The full text of the article was obtained for all studies that made it through the initial screening, and for those articles that required further investigation beyond the title or abstract to determine with certainty that it should be included or rejected.

Each article was assessed against inclusion criteria and critically appraised using objective methodological criteria. Included for analysis and discussion are all studies that met the inclusion criteria, and some studies that were rejected but still provided significant information to explain the results.

RESULTS

Quality of the studies and results of the search

A total of 92 studies were identified using the search strategy. Of these, 10 studies met the inclusion criteria and were included for analysis. No high quality systematic reviews were identified. Four clinical trials, three of which were randomised, were identified. Due to the limited number of experimental studies, all four trials were analysed despite methodological insufficiencies.¹¹⁻¹⁴ Four observational studies were included for analysis,¹⁵⁻¹⁹ and two review papers were identified.^{10, 20}

Results of clinical trials focusing on body weight

Four studies were identified that specifically assessed the effect of nut consumption on body weight. **Table 1** outlines the results of these clinical trials. The participants in these studies were healthy and/or overweight, and the duration of the studies was between six and twelve months,^{11,12,14} except one study which had a shorter duration of 19 weeks.¹³ Two studies used almonds,^{11,14} one study used walnuts,¹² and one study used peanuts.¹³

Trials that incorporated nuts into a baseline diet. Two of the four studies added tree nuts to the participants' regular diet, at intakes equivalent to a proportion of their usual daily energy intake.^{11,12} In both these studies participants were advised not to make any dietary changes other than to include the nuts in their daily diet. Of these, one study showed that in 90 healthy and overweight adults consuming approximately 32g of walnuts daily, a small but significant increase in body weight occurred over the six month study period.¹² However, after adjusting for the change in energy intake, body weight, fat mass and percentage body fat changes were minimal and not significant.¹² The second study included 81 healthy and overweight adults, and showed a non-statistically significant change in body weight (+0.4kg) after consuming an average of 54.3g of almonds daily for six months.¹¹ The satiety effect of nut consumption is thought to be one possible mechanism for the small weight gain observed from consuming approximately 35-50g of nuts on top of the usual daily diet, as the amount of gained weight was considerably lower than theoretically predicted.^{11,12} Further investigation of the results showed that those with a lower

BMI at baseline gained weight, whereas those with a higher BMI at baseline lost weight.¹¹

Trials that added nuts to the diet. One study included an intervention arm that added peanuts to the regular diet of the participants without adjusting for energy intake.¹³ Results showed an increase in body weight of 1kg with approximately 90g of peanuts daily for three weeks, however no statistically significant *p* value was reported.¹³

Trials that included nuts as part of an energy-controlled weight loss diet. Two studies included nuts as part of an energy-controlled weight loss diet.^{13,14} One study showed no effect of peanuts on weight loss within an energy-controlled diet for eight weeks,¹³ whereas the other study showed a 62% greater weight loss in the nut consuming group compared to control.¹⁴ In both these studies the satiety effect of nuts was measured, and both reported that nut consumption did not contribute to satiety during the study period.^{13,14}

Interpretation (Table 1). Research in the area of nuts and body weight is limited. Based on the available data, including approximately 80g of nuts daily as part of an energy-controlled eating plan does not lead to weight gain, and may contribute to weight loss.^{13,14} Adding 35-50g of nuts daily to the existing diet may cause weight gain, but to a lesser extent than theoretical predictions.^{11,12} As there are few studies available, further research is required to clarify the role of nut consumption in weight management.

Results of clinical trials focusing on hypolipidemic diets

Table 2 outlines the characteristics of 18 studies that have measured body weight as an outcome in hypocholesterolemic diet interventions specifically focusing on nut consumption. The quality of the studies varies, with the majority completed over four week dietary intervention periods. Seventeen of the studies showed no effect of nut consumption on body weight.²¹⁻³⁷ However, fourteen of the studies aimed to control for changes in body weight by adjusting energy intake and making intervention and control groups equivalent in energy intake.^{23,24,26-29,31-36,38}

Three studies added various types of nuts to the participants' normal diets, therefore contributing extra energy, however the results showed no change in body weight.^{22,30,34} A possible explanation proposed for the weight stability is that nuts may have a satiating effect, causing participants to replace other foods in the diet with nuts.

Three studies that incorporated nuts into a baseline diet reported weight loss over the study period.^{27,31,32} However, the weight loss was not specific to the nut intervention group (i.e. it occurred during the control period as well), suggesting it was the effect of dietary monitoring or other factors that caused the weight loss.^{27,31,32}

Interpretation (Table 2). Incorporating nuts into a hypocholesterolemic energy-controlled diet does not cause weight gain and may contribute to weight loss in the short term. If 100g of nuts are added to a habitual diet with no adjustment for the additional energy intake, nuts may contribute to an increase in body weight.³⁹

Table 1. Results of clinical trials on nut consumption and body weight

Reference	Study characteristics						Conclusion
	Design	Subjects	Length	Diet Control	No of Nuts	Body Weight Outcome	
Alper 2002 ¹³	Clinical trial	15 healthy adults	19 weeks	Habitual diet	Ave. 89g peanuts <ul style="list-style-type: none"> • Added to habitual diet • Added to a modified, calorie controlled diet • Incorporated into a calorie controlled diet 	<ul style="list-style-type: none"> • Habitual diet + peanuts = 1kg weight gain • Modified diet + peanuts = 0.6kg weight gain • Modified diet with peanuts included = no change in body weight 	Peanut consumption has little effect on energy balance when peanuts are added to, or incorporated into, an energy-controlled diet. Little change in body weight over 3 weeks with peanuts added to habitual diets
Fraser 2002 ¹¹	Randomised cross over trial	81 healthy & overweight adults	6 months	Habitual diet	Ave. 54.3g almonds (15% of daily energy intake added to diet)	0.4kg non-significant weight increase $p=0.09$	Adding almonds to the diet daily, does not lead to significant weight gain over six months
Wein 2003 ¹⁴	Randomised controlled trial	65 overweight adults	6 months	LCD† plus carbohydrates	Almonds (84g/day) added to liquid formula-LCD	18% wt loss, 62% greater than control $p<0.0001$	Almonds included in a formula based LCD contribute to sustained weight reduction over 6 months
Sabate 2005 ¹²	Randomised cross over trial	90 healthy and overweight adults	6 months	Habitual diet	Ave. 35.2g walnuts (range 17-56g) (12% of daily energy intake added to diet)	0.4 (0.1) kg weight increase $p<0.01$	Daily walnut consumption may lead to small weight increases if energy balance is not maintained

†Low Calorie liquid formula Diet

Table 2. Results and characteristics of clinical trials that have used tree nuts or peanuts as the focus of the intervention for hypocholesterolemic diets

Reference	Study characteristics							Conclusion
	Design	Subjects	Length	No of Nuts	Diet Control	Diet Energy Controlled	Changes in Body Weight	
Sabate 1993 ³²	Randomised cross over trial	19	61 days	84g walnuts	NCEP Step 1 diet	Yes - isoenergetic	Weight loss $p<0.05$	Weight loss of 1.4 (1.8)kg occurred over the study period, but not specific to treatment period
Abbey 1994 ²¹	Experimental	16	3 weeks	84g almonds and 64g macadamias	Typical Australian diet	Yes - isoenergetic	No change	No significant change in body weight throughout study period
Jenkins 1997 ²⁸	Randomised cross over trial	10	2 weeks each arm	60-100g nuts	Vegetable-based diet	Yes - isoenergetic	No change	No significant difference between weight losses on either diet
Spiller 1998 ³⁴	Randomised controlled trial	48	4 weeks	100g almonds	Olive oil-based diet	Yes - isoenergetic	No change	Body weight remained stable despite extra kJs added to diet
Edwards 1999 ²⁴	Randomised cross over trial	10	3 weeks	Pistachios equivalent to 20% of daily energy intake	Habitual diet	Yes - isoenergetic	No change	Figures not reported
Kris-Etherton 1999 ³⁷	Randomised cross over trial	22	24 days each arm	17-21% of energy from peanuts or peanut butter	AHA Step II diet	Yes - isoenergetic	No change	Weight was maintained within 1kg during study period
Curb 2000 ²³	Randomised cross over trial	30	4 weeks	Macadamia nuts (unclear quantity)	Typical diet and AHA Step 1 diet	Yes - isoenergetic	No change	No effect of nut consumption on body weight
Morgan 2000 ³⁰	Randomised controlled trial	19	8 weeks	68g pecans	Habitual diet	No	No change	No change in body weight between the two diets
Zambon 2000 ³⁶	Randomised cross over trial	49	6 weeks each arm	Mediterranean diet with walnuts 41-56g	Mediterranean diet	Yes - isoenergetic	No change	No statistical difference in body weight from baseline or between diets.
Almario 2001 ²²	Experimental	18	6 weeks each arm	48g walnuts added to HD [†] and added to LFD [‡]	Habitual diet Low fat, weight loss diet	No	No change (HD + nuts) Weight loss (LFD + nuts) $p=0.0076$	The low fat diet, with or without nuts, resulted in significant reduction in body weight compared to the HD. Additionally there was no statistical difference in weight after adding walnuts to habitual diet
Rajaram 2001 ³¹	Randomised cross over trial	23	4 weeks	72g pecans	AHA Step 1 diet	Yes - isoenergetic	Weight loss $p<0.05$	Energy intake was adjusted to prevent changes in body weight, however during the pecan intervention subjects lost weight
Hyson 2002 ²⁶	Randomised cross over trial	22	6 weeks each arm	66g almonds	Almond oil	Yes - isoenergetic	No change	Body weight remained stable over the 12 week study period
Iwamoto 2002 ²⁷	Randomised cross over trial	80	4 weeks	50-54g walnuts	Control diet	Yes - isoenergetic	Weight loss	Body weight reduced over study period, but not specific to diet treatments

Table 2. Results and characteristics of clinical trials that have used tree nuts or peanuts as the focus of the intervention for hypocholesterolemic diets

Reference	Study characteristics							Conclusion
	Design	Subjects	Length	No of Nuts	Diet Control	Diet Energy Controlled	Changes in Body Weight	
Jenkins 2002 ²⁹	Randomised cross over trial	27	1 month each phase	73g almonds or 37g almonds	NCEP Step 2 diet	Yes - isoenergetic	Weight loss	Half almond dose and full almond dose reduced body weight significantly from baseline, but study aimed to prevent changes in body weight
Lovejoy 2002 ³⁹	Experimental	20	4 weeks	100g almonds	Habitual diet + almonds	No	Weight increased $p=0.006$	Weight slightly increased <1kg, and was statistically significant
Garg 2003 ²⁵	Experimental	17	4 weeks	40-90g macadamias	No control diet	No	Weight loss $p < 0.05$	Body weight significantly reduced after 4 weeks of macadamia nut intervention
Sabate 2003 ³³	Randomised cross over trial	25	4 weeks	68g almonds (20% of energy intake)	AHA Step 1 diet	Yes - isoenergetic	No change	Body weight remained stable during intervention
Spiller 2003 ³⁵	Randomised controlled trial	38	4 weeks	100g almonds	Almond butter diet	Yes - isoenergetic	No change	Body weight remained stable during intervention

†Habitual diet; ‡Low-fat diet

Fourteen out of the 18 studies that reported body weight measures as part of a hypocholesterolemic dietary intervention that included nuts showed no change in body weight with up to 100g of nuts consumed per day.

Three studies reported that when subjects consumed a nut-containing diet, weight decreased despite the study aiming to prevent changes in body weight. Additionally, there is some evidence to show that nuts as part of an energy-controlled diet can assist with weight loss.^{22,25,29,31}

Results of epidemiological studies

Five major epidemiological studies have assessed the impact of nut consumption on body weight or BMI.¹⁵⁻¹⁹ All longitudinal studies reported on risk factors for coronary heart disease (CHD), and body weight or BMI was reported as an outcome. The characteristics of the studies are outlined in **Table 3**. In all of these studies, a serving of nuts was classified as 28g and the nut varieties consumed were not specified, except in the Nurse's Health Study where peanuts were specified separately in the 1986 and 1990 food frequency questionnaires. Three of the four studies found a trend with higher nut consumption and a lower BMI,^{15, 16, 18, 19} however only one of these studies reported statistical significance.¹⁹ One study found no association between nut consumption and BMI.¹⁷

Interpretation (Table 3). Epidemiological evidence indicates that people consuming five servings or more of nuts per week do not weigh more than people who consume less than one serving of nuts per week. The evidence suggests that there is a trend towards frequent nut consumers having a lower BMI than non-consumers.

Evidence for the role of nuts in body weight in type 2 diabetes

Three studies have investigated the effects of nut consumption in people with diabetes,^{6, 39, 40} with only one of these reporting the effects on body weight.⁴⁰ This study compared the effects of three dietary interventions on various outcomes in subjects with type 2 diabetes. The study interventions included a low-fat diet as the control group, a modified-fat group consuming a low-fat diet with variations in fatty acid contents, and a walnut group that consumed a low-fat/modified-fat diet including 30g of walnuts. Energy intake was isocaloric for all treatment groups and remained constant throughout the study period. The results showed that BMI remained stable during the six months of dietary intervention for all participants, with the 17 participants in the walnut intervention group showing no change in body weight after six months. Of note is that people in the walnut group had fatty acid intakes closer to the optimal for type 2 diabetes management.

Interpretation. Evidence for the role of nuts in weight management in people with type 2 diabetes is very limited, however the available evidence indicates that nuts provide favourable nutrients to the diet and assist people with diabetes achieve optimal fatty acid intakes.⁶ Based on one study only, when included as part of a healthy diet, nuts did not contribute to weight gain in people with type 2 diabetes.

DISCUSSION

After reviewing the evidence, there is limited high-quality data available that has investigated the direct effect of nuts on body weight. However, the available data indicates a lack of evidence to restrict nut consumption within a person's habitual diet as a strategy to manage body weight. This finding is consistent with the conclusions of

Table 3. Results and characteristics of the epidemiological studies that included measures for changes in body weight

Study	Subjects included (sex)	Length of Follow-up	Nut Consumption	BMI (kg/m ²)	p value	Conclusions
California Seventh Day Adventist Health Study ¹⁹	31,208 (M and F)	Not Specified	<1 serve/month ≥5 serves/week	Negative association between nut consumption and BMI	Statistically significant	There was a statistically significant negative association between consumption of nuts and BMI, showing that the higher nut consumers were less obese
Iowa Women's Health Study ¹⁸	34,111 (F)	12 years	<1 serve/month >5 serves/week	27.1 26.2	Not given	Higher frequency of nut consumption was associated with a lower BMI and a lower waist-to-hip ratio
Nurses' Health Study ^{15 16}	83,818 (F)	14 years	Almost never ≥5 serves/week	24.8 23.4	Not given	Women who frequently consumed nuts were leaner than those who rarely consumed nuts
Physicians' Health Study ¹⁷	21,454 (M)	17 years	Rarely/never ≥2 serves/week	24.9 24.7	Not given	There was no difference between BMI in those that consumed nuts more than twice a week compared to those that rarely or never consumed nuts

previous reviews in this area.^{10, 20, 41} The epidemiological evidence indicates that there is a trend toward higher nut consumers being leaner than non-nut consumers.¹⁵⁻¹⁹

Nuts and body weight

The available clinical trials investigating the role of nut consumption in body weight show varying results. In the studies that added nuts to the regular diet of participants without controlling energy intake, all hypothesised that body weight would increase due to the additional daily energy intake. However actual weight variations were less than predicted. Furthermore, although some of these studies show small non-significant increases in body weight, any weight gain at a population level may be detrimental to health regardless of whether the extent of that gain is less than expected. It is therefore essential that further research on nuts and body weight be conducted in this area.

A consistently proposed mechanism for nut consumption not resulting in the amount of weight gain theoretically predicted is that when nuts are added to the diet, participants tend to displace the extra energy by modifying their intake of other foods (i.e. substituting other foods in the diet with nuts).¹¹⁻¹³ For example, in two of the clinical trials reported on in this review, further investigation into the participants' dietary records showed that despite being advised to make no dietary changes other than to include nuts, participants unintentionally replaced other foods in the diet with the nuts, therefore energy intake was not as high as predicted.^{11, 12} Alternatively, some authors suggest the mechanism for the lack of weight gain when nuts are added to the diet is related to the malabsorption of fat.^{10, 20} Preliminary studies have shown that the lipids from almonds are not completely absorbed during digestive processes, and therefore do not contribute the presumed amount of energy to the diet.^{42, 43} However this has yet to be confirmed by larger studies, and one trial does not support this proposed lipid malabsorption hypothesis.¹³ Other feasible explanations for the lack of weight gain with increased nut consumption include:

1. Nuts exert a satiating effect therefore reduce total energy intake;^{10, 20}
2. The composition of nuts may affect energy metabolism in such a way that it compensates for the increase in energy availability;^{10, 20}
3. Reverse causation (i.e. obese people avoiding nuts due to the fat content, whereas lean people have fewer restrictions).^{10, 20}

The results of one study indicate that including tree nuts as part of an energy-controlled diet may assist with achieving greater weight loss.¹⁴ Additionally, although not energy-controlled, or specifically designed to cause weight loss, another study showed that adding almonds to the habitual diet of overweight participants resulted in weight loss.¹¹ This indicates that nuts may have potential benefits for weight management in overweight people. Other research suggests that altering dietary fat intake may be a contributing factor to weight loss and weight management in overweight people. One study showed that a higher fat, energy-controlled diet which included nuts showed greater weight loss compared to a traditional low-fat weight loss diet.⁴⁴ Another small study showed

that replacing saturated fats with monounsaturated fats from nuts, olive oil and avocado contributed to weight loss without reducing energy intake or total fat intake.⁴⁵ Observational studies have also shown an association between a lower BMI and eating patterns that include tree nuts.^{7, 8} However, additional research is required to further clarify the mechanisms by which tree nuts may assist with weight loss.

Nuts and coronary heart disease/diabetes

The inclusion of nuts in the diet as part of the management and treatment of other health problems is supported in the research, especially in those for which excess body weight is a risk factor. Being overweight is a risk factor for type 2 diabetes, and although there is limited research in this area, indications are that nut consumption as part of the dietary management of type 2 diabetes has no effect on body weight.⁴⁰ Additionally, nuts provide favourable nutrients to the diet and can assist people with diabetes achieve optimal fatty acid intakes.⁶

Nuts also have a beneficial role to play in reducing the risk of CHD, for which risk factors include hypercholesterolemia, excess body weight, and hypertension. Research shows that there is a clear dose-response relationship between increased nut consumption and reduced risk of CHD. Epidemiological evidence demonstrates that frequent nut consumption significantly reduces the risk of developing CHD in men and women, and significantly reduces mortality from CHD. The degree of risk reduction for CHD with a minor dietary change to include nuts regularly in the diet is significant, with research showing a 30-50% risk reduction from eating nuts two to five times per week.^{16, 17, 19, 46, 47} Other dietary interventions, such as the Portfolio Diet, use a combination of foods and nutrients including soluble fibre, soy protein and tree nuts to lower cholesterol, and therefore reduce the risk of CHD.^{28, 29, 48, 49} The DASH (Dietary Approaches to Stop Hypertension) diet is an example of a cardio-protective diet that includes tree nuts, as well as other dietary components, in order to reduce hypertension.^{50, 51} In the eighteen studies reviewed here that measured body weight as an outcome of a hypocholesterolemic diet, it was shown that including up to 100g of tree nuts as part of an energy-controlled diet has no effect on body weight and has a positive effect on serum cholesterol levels.

The strong and consistent evidence for the beneficial role of nuts in CHD risk reduction has contributed to the development of public health recommendations by the National Heart Foundation of Australia and the National Health and Medical Research Council to include nuts regularly in the diet for cholesterol management and for general healthy eating. Other national and international government reports, and key health authorities that support and encourage healthy eating, recommend incorporating nuts regularly in the diet. These include the Australian Guide to Healthy Eating,⁵² the Dietary Guidelines for Australians,⁵³ the National Heart Foundation of Australia,⁵⁴ the American Heart Association,⁵⁵ the World Health Organisation,⁵⁶ the National Cholesterol Education Program Expert Panel,⁵⁷ the Heart and Stroke Foundation of Canada,⁵⁸ and the US Food and Drug Administration.⁵⁹

CONCLUSIONS

Nuts, as part of an energy-controlled weight loss plan, may assist with weight loss.^{13,14} By adding nuts to a person's existing diet without adjusting for energy intake or increasing physical activity levels, body weight may increase, but to a lesser extent than theoretically predicted.^{11,12} Evidence suggests that consumption of nuts as part of a hypocholesterolemic diet does not affect body weight, and may even assist with weight management. For people with type 2 diabetes there is limited evidence, but the available research indicates that nuts as part of a healthy diet do not cause weight gain and can assist in the achievement of optimal fatty acid profiles.⁴⁰ For health professionals, advising individuals to include a handful of nuts (serving size 28g) as a snack is an easy way to incorporate nuts into a healthy diet.

This review highlights a lack of evidence to support the restriction of nut intake as part of a diet for weight management. Nuts can be included as part of a healthy, balanced diet for weight maintenance, and can be included as part of an energy-controlled diet for weight loss. Further research is needed to assess the role of nuts in a weight loss diet, and further research is also required to identify why nuts do not cause the predicted amount of weight gain when added to a person's habitual diet.

ACKNOWLEDGEMENTS

The authors would like to acknowledge the input of Dr Tim Gill from Clark Gill Consulting, who independently reviewed this article and Elizabeth Dunford for her editing. The authors would also like to thank Horticulture Australia Limited (HAL) who, in partnership with the Australian Tree Nut Industry's program Nuts for Life, partly funded this review paper. The Australian Government provides matched funding for all HAL's R&D activities.

AUTHOR DISCLOSURES

Sharon Natoli and Penelope McCoy, disclose no conflicts of interest other than those in the ACKNOWLEDGEMENTS.

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Review Article

A review of the evidence: nuts and body weight

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實證綜論：堅果與體重

目前並沒有單一飲食或生活型態介入對長期減重有效。傳統減重飲食傾向降低總脂肪，因此經常限制堅果的攝取。然而，堅果是多種維生素、礦物質、單元不飽和脂肪酸以及多元不飽和脂肪酸的重要來源。本文查證目前所有關於堅果攝取與體重的文獻，結果發現堅果攝取在體重控制的角色差異極大。當將堅果納為熱量控制飲食的一部份的時候，有些例子指出有助於減輕體重。但若將堅果加進去目前的飲食，而不控制熱量攝取量，則會增加體重，儘管增加的重量較預期的少。堅果攝取對第二型糖尿病的影響的證據並不太多，有限的證據指出，對糖尿病人而言，堅果是健康飲食的一部份，不會增加體重，且對糖尿病患者的脂肪酸形態有正向影響。本綜論指出並沒有證據可以支持體重管理需要限制堅果攝取，還需要更進一步的研究堅果在體重管理的角色。

關鍵字：堅果、體重、身體質量指數、減重、糖尿病、第二型。