



NUTS & THE BIG FAT MYTH

The positive role for nuts in
weight management





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FOREWORD

The health story for tree nuts continues to gain momentum following three major pieces of population research; the Seventh Day Adventist study (1992), Nurses' Health Study (1998) and the Physicians' Health Study (2002), all of which found a relationship between nut consumption and a decreased risk of coronary heart disease. Nuts have also been associated with a decreased risk of type 2 diabetes and are of great interest to us at Weight Watchers when it comes to healthy weight management.

Once a slimmer's foe, nuts are well and truly back on the weight-loss menu. Research shows regular nut eaters can maintain a healthy weight and clinical studies have also shown that people do not gain weight as expected when they add nuts to their diet. On the Weight Watchers program the protein and dietary fibre content of nuts are promoted for appetite satisfaction or satiety, along with their superior nutrient density and healthy monounsaturated and polyunsaturated fat profile.

In practical terms, our Members learn that a portion controlled, handful (30grams) of unsalted nuts is a wise *SmartPoints* investment, especially to help keep mid-meal hunger under control. We also utilise nuts in recipes to add flavour and texture to meals, such as a crust for fish with crushed nuts, wholegrain breadcrumbs and fragrant herbs.

We welcome this report and insights to help bust the myth that nuts are to be avoided. In fact, we should encourage their inclusion in the diets of those striving for good health and a healthy weight.

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INTRODUCTION

This report addresses the major barrier to nut consumption by Australians – the myth that nuts make you overweight. According to 2016 Consumer Insights research commissioned by Nuts for Life, 95% of Australians do not eat a handful of nuts a day and the number one health-related reason is because they are concerned about nuts' fat and calorie content and their potential to cause weight gain.¹

Nuts are a nutrient-dense, whole food that plays an important role in healthy diets to help protect against chronic disease and manage body weight. Yet according to the market research, Australians – including some health professionals – are confused about the role nuts can play in weight management diets.

Nuts and The Big Fat Myth considers evidence spanning the last 24 years on nuts and their impact on weight – including weight management in diets designed to achieve other outcomes, such as lowering cholesterol or stabilising blood glucose.

Compared with non-nut eaters, those who eat nuts:

- Tend to have a lower body mass index (BMI)²⁻⁶
- Are less likely to gain weight over time⁷⁻¹⁰
- Tend to have better diet quality¹¹⁻¹⁵
- Have less incidence of chronic disease^{2-4,6,16-20} and
- Have reduced cardiovascular disease and all cause mortality²¹⁻²⁷.

In 2015 Nuts for Life commissioned a systematic literature review to assess the impact of nuts on heart health parameters and to determine if weight change affects these results. The researchers found that regular nut consumption

as part of a healthy, balanced diet contributes to heart health without causing weight gain. While the exact amount of nuts needed to generate the best results has not been calculated the assessed studies used around 20-120grams of nuts a day.²⁸ Research also shows including nuts in energy-controlled diets can result in weight loss.²⁹⁻³⁴

With nearly two thirds of adults and a quarter of Australian children overweight or obese³⁵ – a condition fundamentally linked to poor food choice and a lack of exercise – it is essential that we encourage Australians to base their food choices on nutrient-rich, whole foods. It's these foods that should be eaten more often including fruits, vegetables, mushrooms, wholegrains, legumes, seeds and nuts.³⁶

Nuts for Life is pleased to bring this evidence on nuts and their positive role in weight management to light, in the hope it allays any fears that eating a 30gram handful of nuts a day will result in weight gain.

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Did you know?

Tree nuts include: almonds, Brazil nuts, cashews, chestnuts, hazelnuts, macadamias, pecans, pine nuts, pistachio and walnuts.

“ 95% of Australians do not eat a handful of nuts a day and the number one health-related reason is because they are concerned about nuts' fat and calorie content and their potential to cause weight gain.¹ ”

DISPELLING THE MYTH - NUTS AND THEIR WEIGHTY FACTS

In both large population based studies and clinical trials, nut consumption is positively associated with weight management particularly prevention of weight gain. The first step to weight loss is the prevention of any further weight gain. Once weight has been lost it is important to prevent weight re-gain and weight cycling. It appears weight cycling may lead to greater central adiposity.⁴⁰ The 2015 Nuts for Life systematic literature review analysed 68 intervention studies (of which 65 were high quality) and found overall generally consuming nuts (15-126grams a day) was associated with an average reduction of 0.32% for weight, 0.67% for body mass index (BMI) and 0.84% for waist circumference, indicating that nut consumption does not result in weight gain.²⁸

POPULATION STUDIES

Adults

Epidemiology research has revealed an inverse association between the frequency of nut consumption and BMI.^{2-5,13,19} Reviews published in 2011 and more recently in 2014 conclude that consumption of nuts is not associated with weight gain in long-term studies⁹, and may actually be beneficial for weight control^{10,41} The PREDIMED Mediterranean Diet study also found that nut consumption was inversely associated with adiposity independently of other lifestyle variables.⁴²

Table 1 (over page) outlines 11 studies^{2-8,13,19,42,43} of which nine found an inverse relationship between nut consumption and weight (seven statistically significant) and two^{6,43} found no association.

Exploring some studies in more detail:

- The Seventh-day Adventist Health study of just over 31,000 people was the first to link increased nut consumption with a reduced risk of developing heart disease. It found a statistically significant decrease in BMI in those eating 30grams of nuts at least five times a week compared to those eating nuts less than once a week.²
- A cross sectional study of 847 elderly Mediterranean men and women at high cardiovascular risk found that BMI and waist circumference decreased (by 0.78kg/m² and 2.1cm respectively) with each 30gram serve of nuts eaten.⁴²
- A more recent 2011 analysis of the Nurses' Health Study, the Nurses' Health Study II (both conducted in women), along with data from men in the Health Professionals Follow-up Study (HPFS) – a total of 120,877 U.S. women and men - found a statistically significant reduction in risk of weight gain over time with nut consumption, comparable to that found with fruit, wholegrains and vegetables.⁸

- Of the two studies that found no immediate association between nut consumption and weight, one of those – The Sun Study – found that those who consumed nuts had a lower risk of weight gain over time. Those who ate 50g of nuts at least twice a week were 31% less likely to gain weight over the 28 month follow-up period.⁴³

Children

In addition there have been two observational studies conducted in children and adolescents. In the first study, 1764 children and adolescents (6-19 years) found that those consuming the highest amount of nuts had on average a 40% reduced risk of being overweight compared to those consuming the lowest amount of nuts.⁴⁴ A cross-sectional study of 800 schoolgirls in Spain found no relationship between frequency of nut consumption (ranging from never to daily) and body weight.⁴⁵

SUMMARY

No observational study has reported a higher BMI in nut eaters compared to low or non nut eaters for children and adults. Those who eat nuts tend to have a lower BMI than those that don't, and those that include nuts in their diets are less likely to gain weight over time.



TABLE 1: EFFECT OF NUT CONSUMPTION ON BODY WEIGHT

Study	Number of Subjects (gender)	Nut Consumption Frequency	BMI (kg/m ²)	Trends
California Seventh Day Adventist Health Study ²	31,208 (M/F)	< 1 serve/month ≥5 serves/week	Figures not given	Statistically significant decrease in BMI with increased nut consumption (P trend P<0.01)
Nurses' Health Study ³	86,016 (F)	Almost Never ≥ 5 serves/week	24.8 23.4	BMI decreased with increased nut consumption
Iowa Women's Health Study ⁴	34,111 (F)	< 1 serve/month >5 serves/week	27.1 26.2	BMI decreased with increased nut consumption
Continuing Survey of Food Intakes by Individuals (CSFII) ⁵	12,088 (M/F)	Nut eaters Non nut eaters	23.8 25.0	Nut eaters have a statistically significant lower BMI compared to non nut eaters (P < 0.001)
Physicians' Health Study ⁶	21,454 (M)	Rarely/never ≥ 2 serves/week	24.9 24.7	No association between nut consumption and BMI
Nurses' Health Study II ⁷	51,188 (F)	Rarely/never ≥ 2 serves/week	24.4 23.8	Statistically significant lower risk of weight gain & obesity with nut consumption (P for trend <0.001)
NEJM analysis ⁸ (combination of NHS I&II and HP Follow Up Study)	120,877 (M/F)	N/A	N/A	Eating fewer nuts over time results in more weight gain (for each one serve of nuts 0.57lb (0.26kg) of weight change, P=0.005)
NHANES 2005-10 ¹³	14,386 (M/F)	Tree-nut consumers (mean 44.3g/day) Non-consumers (mean 3.3g/day)	27.9 28.7	BMI significantly lower in tree nut consumers (p=0.004)
Adventist Health Study II ¹⁹	1,011 (M/F)	Low tree-nut consumers High tree-nut consumers	29.8 26.6	A strong inverse relationship between tree-nut consumption and obesity (p=0.0001)
PREDIMED ⁴²	847 (M/F)	9 grams per day 4 grams per day (median)	25.0 34.4	As BMI, weight and waist circumference increased, statistically significant decrease in nut intake (P<0.001)
The Sun Study ⁴³	8,865 (M/F)	Rarely/never ≥ 2 serves/week	23.6 22.6	No association between nut consumption and BMI

Note: P values for changes in BMI were not reported for references 3 or 4. Statistically significant findings were reported for references.2,5,7,8,13,19,42 N/A is non applicable.

INTERVENTION STUDIES

Over the past 24 years a large body of evidence has been generated from observing the effects of nut consumption on body weight either directly or indirectly as part of different dietary modification studies. A 2013 systematic review and meta-analysis of 33 studies concluded that diets enriched with nuts did not increase body weight, BMI or waist circumference compared to control diets without nuts. In fact there was a non significant decrease in body weight of 0.47kg, BMI of 0.4 and waist circumference of 1.25cm. The amount of nuts consumed in the studies ranged from 15-150grams of nuts a day and the diet periods lasted from two to 152 weeks.⁴⁶ This is further supported by the results of the unpublished Nuts for Life systematic literature review which assess 68 studies (including 65 high quality studies) and concluded: overall the intake of nuts was not associated with weight gain or unfavourable changes in body composition including BMI and fat mass. Again there was an average reduction of 0.32% for weight, 0.67% for BMI and 0.84% for waist circumference. The amount of nuts consumed in the studies ranged from 15-126grams of nuts a day but analysis of the exact amount of nuts to achieve the greatest effect has not been undertaken at this stage.²⁸

Clinical intervention trials have been reviewed by Nuts for Life and categorised as energy controlled diet studies, existing diets, cholesterol lowering diets and diets for diabetes studies as follows.

Energy Controlled Diets

Clinical trials have shown weight loss can be achieved with the inclusion of nuts in specific energy-controlled diets. Highly consistent favourable effects of specific nuts and mixed nut consumption have been found for weight, BMI and waist circumference in intervention studies. Some examples of high quality studies are illustrated here:

- A study of 65 overweight adults over 24 weeks who included 84grams of almonds a day as part of a low calorie formula diet showed those who ate almonds had a 62% greater weight loss than the control group who consumed the same amount of kilojoules with carbohydrate substituted for the almonds ($P < 0.0001$).²⁹
- Another study of 25 overweight or obese adults over 12 weeks found that by adding a 53gram snack of pistachios to their weight loss diet resulted in a significantly greater drop in BMI compared to a similar diet with pretzels as a snack.³¹
- An almond study with 123 overweight and obese participants were randomized to an almond hypocaloric diet, or a nut free hypocaloric diet, and followed for 18 months. The low calorie diet consisted of 1200–1500 kcal/day for women and 1500–1800 kcal/day for men with the addition of two 28gram packs of almonds (24 almonds per package) to consume daily. Both groups lost weight at six months, 5.5kg for the almond group and 7.4kg for the nut free group ($P = 0.04$). There was no significant difference in weight loss at 18 months, although the almond group had better blood lipid profiles.³²

SUMMARY

To date studies have investigated energy-controlled diets that include between 15-126grams/day of nuts, showing that diets supplemented with nuts result in greater reductions in BMI and waist circumference compared to those that don't include nuts. Therefore, the simple message to include a 30gram handful of nuts a day as part of a healthy diet is an easy, sensible recommendation to make.



Adding Nuts to Existing Diets

When nuts are consumed in addition to usual food intake without adjusting kilojoule input or energy output their inclusion shows mixed results - no change in weight, weight loss or a slight weight gain.

Some high quality study examples include:

- The PREDIMED Mediterranean Diet study (commenced in 2003) followed nearly 7,400 adults for an average of 4.8 years comparing a Mediterranean diet (no energy restriction) enriched with 30grams of mixed nuts (walnuts, hazelnuts and almonds) a day or 50mL per day extra virgin olive oil compared to a reduced fat diet. To date, researchers have found:
 - o participants saw no change in BMI or waist circumference after three months⁴⁷,
 - o daily nut consumption caused a beneficial effect on waist circumference reducing the prevalence of abdominal obesity after one year⁴⁸,
 - o In a PREDIMED sub-cohort of 169 adults over one year, researchers found that a Mediterranean diet supplemented with nuts showed significantly reduced waist circumference ($p \leq 0.006$, both) compared to a control diet, or a Mediterranean diet with olive oil.⁴⁹
 - o those with a specific genotype had a higher body weight at baseline but after three years of consuming the Mediterranean diet enriched with 30grams of mixed nuts a day resulted in lower weight gain than the other participants⁵⁰,
 - o there was a minor weight loss in both the nut and reduced fat diet groups after four years⁵¹,
 - o A cross-sectional analysis of 847 PREDIMED participants looked at the links between food intake and obesity measures (BMI and waist circumference). Nut intake decreased across quintiles of both obesity measures; and, independent of other lifestyle variables, eating nuts was inversely associated with both BMI and waist circumference ($P=0.002$). BMI and waist circumference decreased by 0.78kg/m^2 and 2.1cm respectively, for each additional 30gram serving of nuts eaten.⁴²
 - o A further cross-sectional analysis of 7,210 people recruited into the PREDIMED study showed that nut consumption was inversely associated with obesity and central obesity, as well as metabolic syndrome and diabetes.⁵²
- A crossover trial of 90 healthy and overweight individuals showed that including 17–56grams of walnuts a day (equivalent to 493kJ–1624kJ with an average intake of 35grams of walnuts.) to the participants' usual diet increased body weight by 400grams ($P=0.01$) over six months, which became non significant after adjustment for energy intake.⁵³
- A crossover study of 20 healthy subjects, randomised to an almond diet (1440kJ or 55grams of almonds added to the usual diet) or a control diet over a 10 week period, followed by a three week washout period before crossing over to the alternative diet, did not find any evidence of weight gain.⁵⁴ Interestingly researchers found evidence of increased faecal fat excretion after consuming nuts resulting in less energy absorption, which has been shown in other studies.⁵⁵⁻⁵⁸
- A study of 81 healthy and overweight participants showed that over six months, adding an average of 54grams of almonds a day to the participants' usual diet resulted in a non-significant 400gram weight gain ($P=0.09$).⁵⁹ Interestingly, participants with a higher baseline BMI lost weight.
- A randomised, parallel four-week study found adding 43grams almonds to meals or snacks reduced hunger and desire to eat, as well as metabolic benefits – without weight gain.⁶⁰
- A randomised study of 19 people (10 treatment group, 9 control group) treatment group ate 68grams of pecans as part of a self selected diet for 8 weeks resulted in no change in BMI or weight between the groups.⁶¹

SUMMARY

Adding up to ~70grams of nuts to your existing diet without removing other foods, or increasing energy expenditure, may either result in no weight change or slight weight gain. In light of the satiety and appetite effects, recommend eating nuts in place of unhealthy snacks, or as ingredients in meals.





Cholesterol-Lowering Diets

There are many high quality studies involving healthy and hypercholesterolemic participants, with and without diabetes, following nut cholesterol-lowering diets that have measured weight as an outcome.^{30,61-98}

- The vast majority showed there is no change in weight by including 30-100grams of nuts a day in short-term cholesterol lowering diets and all showed improvements in total and/or LDL cholesterol without negatively affecting HDL cholesterol.
- A high quality meta-analysis of 12 walnut and cholesterol lowering studies where participants consumed 30-108grams walnuts over 4-24 weeks found a small non-significant weight loss. Adding walnuts to a cholesterol lowering diet does not cause weight gain.⁹⁹
- Four studies showed that when subjects consumed a nut containing diet, weight decreased despite the study aiming to prevent changes in body weight.^{30,63,77,78}

SUMMARY

Incorporating 30-100grams of nuts a day into a cholesterol-lowering diet may contribute to weight loss and in general does not lead to weight gain.

A systematic literature review of 82 blood lipid studies commissioned by Nuts for Life in 2015 found that eating nuts improves indicators of heart health, including total cholesterol, LDL cholesterol and the ratio between LDL and HDL cholesterol without causing weight gain.²⁸



Enjoying a 30gram handful of nuts at least five times a week can significantly reduce the risk of developing heart disease by 30-50%.^{2-4,6,17,18}



Diets for Diabetes

Investigating the effects of nut consumption on weight in people with Type 2 Diabetes Mellitus (T2DM) has found that the inclusion of nuts may improve diabetes control measures with no change in weight, or a small weight loss.

Examples of high quality studies include:

- A 12-week randomised crossover clinical trial of 20 men and women with T2DM found the addition of 56grams of almonds per day significantly reduced body fat determined by bioelectrical impedance analysis.⁷⁸
- 30grams of walnuts were included as part of a kilojoule-controlled diet in 17 T2DM participants over six months, with results showing no effects on body weight or HbA1c but improvements in blood lipids.¹⁰⁰
- 50 overweight adults with T2DM were assigned to a low fat diet, with and without 30grams of walnuts each day, for one year resulting in 1-2kg weight loss and reduced fasting insulin.³⁰
- In a crossover study of 24 people with T2DM, 56grams of walnuts each day for eight weeks resulted in no change in body weight and improvements in endothelial function.¹⁰¹
- 65 adults with pre-diabetes, given 60grams of almonds daily for 16 weeks found insulin sensitivity and LDL cholesterol levels improved with no change in body weight.⁷⁷
- 117 adults with T2DM were randomised into three diet groups one with 73grams of mixed nuts a day, one muffin, or half serves of both a day for three months. The full nut serve group saw reductions in HbA1C whilst maintaining body weight.⁷⁰
- Interestingly, a sub group of 418 non-diabetic participants of the PREDIMED Mediterranean Diet study consuming a Mediterranean diet enriched with 30grams mixed nuts a day, found a 52% reduced risk of diabetes in the absence of significant changes in body weight or physical activity.⁵¹

SUMMARY

For people with type 2 diabetes, the inclusion of up to around 70g nuts a day (two handfuls) may improve diabetes control measures with either no change in weight, or a small weight loss.

KEY FINDINGS

Nut eaters tend to weigh less than non-not eaters and those that include nuts in their diets are less likely to gain weight over time.

- A systematic literature review of 82 studies found regular nut consumption as part of a healthy diet contributes to heart health without causing weight gain.
- Energy-controlled diets that include 40-80grams of nuts result in greater weight loss than those that don't include nuts.
- Adding nuts to a usual diet without removing food to adjust for energy intake may increase weight, so eating nuts in place of unhealthy snacks is a key recommendation.
- Incorporating 30-100grams of nuts into a kilojoule-controlled, cholesterol-lowering diet may contribute to weight loss and at least doesn't lead to weight gain.
- For people with type 2 diabetes, the inclusion of up to 70grams nuts a day (two handfuls) may improve diabetes control measures with either no change in weight, or a small weight loss.



There is an inverse association between nut consumption and body mass index (BMI).^{2-5,13,19}



MECHANISMS: HOW DO NUTS HELP MANAGE WEIGHT?

The mechanisms by which nuts help to manage body weight, and may help to reduce weight, have been examined in scientific research conducted over the last 24 years.

REDUCING APPETITE

Research shows that the fat content of nuts may cause the release of satiety hormones^{55,102-104} such as cholecystokinin (CCK) in the digestive system.

In addition, the high levels of protein and fibre in nuts may also act to satisfy hunger and reduce appetite.^{105,106} Snacking is often considered one of the causes of weight gain. Research has found the positive effect of nuts on appetite appears to be greater when nuts are consumed whole compared to butters or spreads, and when nuts are consumed as a snack rather than being incorporated into meals.^{41,60} Another two studies however have found nuts cause satiety in both one meal and the following meal by reducing the desire to eat.^{107,108} In other words, the form of the nuts and the time of eating nuts affects the magnitude of appetite suppression. Cracking nuts from the shell can also help to reduce intake by providing visual cues as to how much has been eaten.^{109,110}

ENERGY ABSORPTION

The fat and energy content of nuts as determined in the laboratory is greater than the amount absorbed by the body, with research suggesting that up to 15% of the energy in nuts is excreted.⁵⁵⁻⁵⁸ Many studies have found nut eaters excrete more fat in their stools, so less fat and energy is absorbed.^{55,56,58,111,112} More recently, research has found the Atwater factors used to calculate the energy in foods may not be accurate for nuts. When applied to almonds, Atwater factors resulted in a 32% overestimation of their measured energy content. So, a 30gram serve of almonds actually contains 580kJ rather than 760kJ.¹¹² Similarly the measured energy density of pistachios was found to be 22.6kJ/gram, which is 5% less than the currently accepted energy value of 23.7kJ/gram, as calculated using the Atwater factors.¹¹³ For walnuts Atwaters factors overestimate the available energy for walnuts with one 28gram serving of walnuts containing 146 kcal (5.22kcal/gram), 39kcal/serving less than the calculated value of 185 kcal/serving (6.61 kcal/gram) using Atwater factors. The available energy of the walnuts was 21% less than that predicted by the Atwater factors (P < 0.0001).¹¹⁴ It could be the behaviour of nut oil bodies in the intestine that makes them more resistant to digestion.^{115,116}

INCREASED METABOLISM

A review of intervention trials found, metabolism increases immediately after consuming nuts, and this increase can account for up to 10% of their energy content.⁵⁷

LOW GLYCEMIC INDEX (GI) EFFECT

Although nuts in general do not have a GI ranking, as they have too little carbohydrate to be GI tested, nuts have a GI lowering effect by slowing the digestion of a carbohydrate rich meal. This results in a slower rise in blood glucose after the meal, satisfying the appetite for longer.^{70,107,117-123}

Cashews and chestnuts contain the highest amount of carbohydrates of all nuts. Cashews have been GI tested and have a low GI of 25.¹²⁴ Chestnuts are more like a grain than a nut - low in healthy fats and rich in low GI carbohydrates. While whole chestnuts have not been GI tested, chestnut meal or ground chestnut has, with a low to moderate GI of 54.¹²⁵ Since GI is affected by particle size whole chestnuts would most likely have a low GI.

INSULIN EFFECTS

Insulin resistance is linked to weight gain through chronic inflammation.¹²⁶ A study conducted in healthy adults showed that a walnut-rich meal, increased adiponectin – a hormone associated with reducing insulin resistance and metabolic syndrome.¹²⁷ Nuts have been shown to reduce insulin levels and improve insulin sensitivity in intervention trials, which may help explain effects on weight.^{30,55,111,118,126} Nuts have also been shown to help reduce inflammation markers.^{126,128}

BETTER COMPLIANCE

Research has shown that weight management diets that include nuts are considered more palatable and enjoyable, and as a result those following these diets are more likely to comply with their eating plans for longer – and have greater success.¹²⁹⁻¹³¹

Chew Less.

If you chew nuts less you absorb less fat.⁵⁵ Similarly if you eat whole nuts instead of nut butters less fat is absorbed.⁵⁸

GENERAL HEALTH

Nuts represent a core food in the diet of Australians. Nuts, like fruit and vegetables, are a vital part of a healthy diet and scientific research is proving why. Tree nuts are key sources of at least 28 different essential nutrients and bioactive substances, such as healthy monounsaturated and polyunsaturated fats, protein, fibre, folate, vitamin E, phytosterols and arginine – a unique nutritional powerhouse.¹³² It is no surprise then that research has found a relationship between nut consumption and:

- reducing the risk of heart disease^{2-4,6,17,18,21,26,28}
- lowering cholesterol^{28,133,134}
- reducing the risk of Type 2 Diabetes^{16,20,51}
- controlling blood glucose^{70,107,117-123,135}
- managing weight²⁸.

DIET QUALITY

Nut eaters have been found to have a better diet quality than non-nut eaters.¹¹⁻¹⁵ Some studies include:

- A 2015 analysis of the 2005-2010 NHANES data found that nut consumers had a significantly higher nutrient adequacy and diet quality than non-consumers. People eating nuts had better nutrient adequacy for vitamins A, C, folate; minerals calcium, iron, magnesium, zinc and potassium; as well as better intakes of fibre. The researchers concluded that tree nut consumption should be encouraged by health professionals.¹³
- In a 2011 US study, the diets of 'out-of-hand' tree nut consumers were compared with non-tree nut consumers on measures of fibre, vitamin E, calcium, magnesium, potassium and sodium. Tree nut consumers had significantly

better diet quality, with a higher overall diet quality score and improved nutrient intakes. The researchers concluded that 'out-of-hand' nut consumption should be encouraged by health professionals.¹¹

- Another 2011 study investigated the impact of different snacks - including hazelnuts, chocolate, or potato crisps compared to a control group receiving no snacks for twelve weeks. Effects on body weight and composition, blood lipids and lipoproteins, resting metabolic rate (RMR), appetite indices, and dietary quality were compared. At week 12, there was no significant difference in any of the outcome measurements between the groups except for dietary quality, which improved significantly in the nut group.¹²
- A postpartum diet quality study reviewed Australian women following a gestational diabetes pregnancy and found that those not consuming nuts/ legumes, grains and fruits had the poorest diet quality scores.¹⁴ Given these foods are important for chronic disease risk reduction the authors concluded that health professional advice and follow up is essential.

HEART DISEASE

Studies show enjoying a 30gram handful of nuts at least five times a week can significantly reduce the risk of developing heart disease by 30-50%.^{2-4,6,17,18,21,26,28} Even those who eat nuts once a week have less heart disease than those who don't eat any nuts.² Frequent nut consumption is associated with lower levels of inflammatory markers^{126,128} which may partially explain the lower risk of both heart disease and diabetes.^{2-4,6,16-18,20,21,26,28} In general, you can achieve an 8.3% reduction in risk of death from coronary heart disease with each additional 30gram weekly serving of nuts.¹³⁶



CHOLESTEROL LOWERING

A meta analysis combining the results of 25 nut and cholesterol-lowering studies found that around two handfuls of nuts – 67grams on average each day – significantly reduced total and LDL cholesterol by 5% and 7% respectively.¹³³ More recently, a systematic review, meta-analysis and dose response of 61 controlled intervention trials concluded that tree nut intake lowers total and LDL cholesterol, with stronger effects observed at doses of greater than 60grams of nuts a day.¹³⁴

DIABETES

Eating a handful of nuts (30grams) at least five times a week may also lower the risk of developing Type 2 Diabetes by around 25%.¹⁶ A 2014 meta analysis of six studies found a 13% reduced risk of T2DM with four 30gram serves of nuts a week.²⁰ Although two other meta analyses found no such association.^{23,26} A PREDIMED Mediterranean Diet enriched with 30grams of nuts a day may also reduce the risk of developing diabetes by 52%.⁵¹ As described earlier, nuts lower the glycemic index of a meal and improve insulin sensitivity. This in turn improves blood glucose control, appetite control and therefore, reduces the risk of developing diabetes and weight gain.

Eating a healthy handful of mixed nuts (30grams) provides 25% of the recommended dietary intake (RDI) for vitamin E, nearly 20% of the RDI for magnesium, nearly 10% each of the RDI for iron and zinc, and 7% of the RDI for folate. Plus it contains protein, fibre, plant sterols and omega-3s.¹³²



HEALTH STAR RATINGS FOR NUTS

The Health Star Rating System is a voluntary Australian Government front-of-pack labelling system that rates the overall nutritional profile of packaged food and assigns it a rating from ½ a star to 5 stars. It provides a quick, easy, standard way to compare similar packaged foods. The more stars, the healthier the choice. Nuts are nutritious, healthy foods, and this is reflected in their star ratings. Similar to all other plant foods: fruit, vegetables, legumes, mushrooms; all unsalted nuts score between 4 and 5 stars (based on nutrient composition per 100g).



HSR for raw mixed nuts

Keep your nuts cold but eat them warm.

To keep your nuts fresh, store them in an airtight container in the fridge. Just like margarine, the oils can go rancid more quickly if left opened in the pantry. Bring them back to room temperature before eating or warm them in the microwave or oven. The volatile oils creating the taste and aroma of nuts will be... well...nuttier.

Nuts are an important source of essential fats (see Table 2). While all nuts, apart from chestnuts, are high in fat (49-74%), they are predominantly the healthy monounsaturated and polyunsaturated fat, with very low proportions of saturated fat. It's these healthy fats that help manage cholesterol and maintain heart health.

TABLE 2: FAT CONTENT OF TREE NUTS

	Total Fat (g)	Saturated Fat (g)	Monounsaturated Fat (g)	Polyunsaturated Fat (g)	Omega-3 fat as ALA (mg)
Almond	54.7	3.7	35.9	12.8	0
Brazil Nut	68.5	14.8	21.8	29.0	0
Cashew	49.2	8.4	31.1	7.5	0
Chestnut	0.6	0.1	n/a	n/a	n/a
Hazelnut	61.4	2.7	48.8	7.2	120
Macadamia	74.0	10.0	59.8	3.8	99
Peanut	47.1	7.0	22.9	14.9	3
Pecan	71.9	4.5	39.3	25.0	620
Pine Nut	70.0	4.2	23.0	39.8	0
Pistachio	50.6	5.8	26.7	15.8	0
Walnut	69.2	4.4	12.1	49.6	6280
Mixed Nuts	63.3	6.5	33.2	21.2	791

Sources: NUTTAB 2010 and USDA Standard Release 28, 2015 (n/a = data not available)



Australian adults need to increase their nut consumption by 350% to reach the recommended serving size of 30grams a day.³⁶



NUTS AND AUSTRALIAN DIETARY GUIDELINES

The National Health and Medical Research Council (NHMRC) states in the Australian Dietary Guidelines:

"...nuts are rich in energy (kilojoules) and nutrients. In addition to protein and dietary fibre, they contain significant levels of unsaturated fat and are rich in polyphenols, phytosterols and micronutrients, including folate, several valuable forms of vitamin E, selenium, magnesium and other minerals. They are nutritious protein alternatives to meat, fish and eggs, and are particularly important in plant-based, vegetarian and vegan meals and diets."¹³⁷

The evidence underpinning the dietary guidelines states that *"consumption of nuts and seeds may help reduce the risk of heart disease" and that the "evidence suggests that consumption of nuts (65–110g per day) is associated with a reduction in serum cholesterol, a surrogate marker for cardiovascular disease (Grade C, Section 8.2 in Evidence Report)."¹³⁷*

The report also states the consumption of nuts is not associated with weight gain if total energy (kilojoule) intake is controlled with the *"evidence suggesting that the consumption of nuts (65–110g per day) does not lead to weight gain, at least in the short term (Grade C, Section 8.1 in Evidence Report)."¹³⁷*

This report notes that since the previous dietary guidelines, the evidence of a lack of association with weight gain is a new development. *"Proposed mechanisms for effects on weight control include increased satiety, increased faecal fat excretion, increased thermogenesis and increased fat oxidation."¹³⁷*

Since nut intakes have traditionally been low, the intake for children over eight years of age needs to triple and adult intakes need to increase substantially.¹³⁷ In the NHMRC report *A Modelling System to inform the Revision of the Australian Guide to Healthy Eating* it states that Australian adults need to increase their nut consumption by 350%³⁶ to reach the proposed recommended serving size of 30grams.¹³⁷

The eating frequency of this 30gram handful is dependent on age, gender, life stage and energy needs, however is generally between 2-14 serves a week and can be either as whole nuts or nut pastes where needed. A general message of eating a handful of nuts (30grams) a day is easier for health professionals to recommend and for the general public to remember.



NUT CONSUMPTION MARKET RESEARCH

Nuts for Life has commissioned market research to measure health professional and consumer attitudes and behaviours towards nut consumption and the health benefits of nuts, at regular intervals since 2003. A summary of the 2016 research¹ results are as follows:

HEALTH PROFESSIONALS

Despite overwhelming evidence and understanding of the benefits of a handful of nuts a day among health professionals - with 93% of dietitians and 78% of general practitioners agreeing that nuts should be a part of a healthy daily diet - this does not translate to their own behaviour.

While 5% of the general public consume a handful of nuts a day, only 4% of general practitioners (GPs) meet the daily recommendation and 17% include some nuts in their weekly diets. Dietitians fare marginally better, with 9% saying they eat a handful of nuts a day and 28% eating them weekly.

One of the key reasons for low nut consumption among some health professionals may have been revealed by comments health professional respondents made to the survey - they are confused about the role nuts can play in weight management diets. When asked about the potential negatives associated with including nuts in a daily diet, the biggest responses from health professionals were around portion control and the energy and fat content of nuts.

However, the potential role for nut consumption in chronic disease protection is well understood – with 97% each of dietitians and GPs agreeing that nuts have a role in preventing heart disease and 95% dietitians and 85% GPs agreeing that nuts have a role in preventing diabetes. Additionally, 92% and 79% of dietitians and GPs respectively believe nuts play a positive role in lowering cholesterol.

When asked about the role of nuts in overweight and obesity, 91% of dietitians agreed that nuts have a role in preventing overweight and obesity and 80% agreed that nuts have a role in managing overweight and obesity.

GPs were less sure, with 75% saying nuts had a role in preventing overweight and obesity, and 62% saying they had a role in managing overweight and obesity. Between 13% and 21% of GPs said they didn't know whether nuts can play a role in either.

When it comes to recommending nuts to their patients, only 20% of GPs frequently did so, with 41% rarely or never recommending them. Dietitians are significantly more likely to recommend their patients eat nuts – with 88% frequently

recommending them compared to 3% who never or rarely recommend them.

GENERAL PUBLIC

Nut consumption among Australians is low. Most Australians eat nuts only fortnightly, monthly or even less often with only 16% eating them weekly and 12% eating some nuts everyday – although only 5% eat a handful (30grams) of nuts a day. The most frequently cited health related reason for not eating nuts is concern about the fat content of nuts and their potential to cause weight gain.

Of those who do eat nuts, the majority eat them at parties (54%), on planes (39%), watching TV (32%), or at work/desk (29%), pre-dinner with a drink (29%) or at afternoon tea (28%).

Cooking with nuts has consistently been increasing over the last 5 years or so with 62% of respondents reporting they cook with nuts at least monthly. They report more recipes are using nuts as ingredients. Nuts for Life has reviewed recipes from food, women's and health magazines to determine how many, and what type of, recipes use nuts as ingredients.³⁷ Results of our last study in 2010 found that 16% of all recipes use nuts as ingredients but the most common type of recipe to use nut ingredients was in cakes and dessert recipes. The most common recipe type found in magazines however was for main meals. The benefit of nuts in main meals is less well known.

The Australian Health Survey (2011-13) found Australians on average are consuming just 6grams of nuts a day.³⁸ These results mirror the Australian Tree Nut Industry's own apparent consumption data based on wholesale sales and Australians are consuming 7grams per person per day.³⁹ Note this does not include peanuts, which are not actually a nut but a legume.

The National Health and Medical Research Council (NHMRC) stated in their report *A Modelling System to inform the Revision of the Australian Guide to Healthy Eating* that Australian adults and Australian children (9-18 years) need to increase their nut consumption by on average 350% and 250% respectively to reach the recommended serving size of 30grams.³⁶

It appears health professionals and the general public have some awareness of the role of nuts for weight management but still struggle to translate this to their own behaviour of eating a 30gram handful of nuts a day for fear of weight gain.

CONCLUSION

One of the biggest diet myths is busted – eating nuts does not lead to weight gain.

In fact in the past 24 years, there has been scientific evidence supporting the role of tree nuts in energy-controlled diets for weight loss, as well as both short and long-term weight management.

People with a regular nut habit have lower BMIs, are less likely to gain weight, have healthier diets, and are at lower risks of chronic disease than people who do not eat nuts.

The misconception among the general public and health professionals that nuts are high in fat and therefore “fattening” is a key hurdle stopping 95% of Australians from eating their recommended handful of nuts a day.

Given the epidemic prevalence of diet-related chronic disease in Australia, it is vital that Australians are encouraged to consume more nutrient-rich, whole foods – fruit, vegetables, mushrooms, wholegrains, legumes, seeds and nuts.

In addition to helping weight management, the strength of scientific evidence supports eating a handful or two of nuts a day to reduce the risk of heart disease, diabetes and obesity, as well as to manage many of their biomarkers such as blood cholesterol and glucose.

Working with Government, health authorities, health professionals and industry, Nuts for Life is committed to sharing evidence based advice on the health benefits of tree nuts and educating Australians on why and how to reach the recommended intake of a 30gram handful of nuts a day.



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This project has been funded by Horticulture Innovation Australia Limited with co-investment from members of the Australian Tree Nut Industry and funds from the Australian Government.



Nuts for Life is a nutrition education initiative to promote the health benefits of regular nut consumption in the Australian diet. It is staffed by accredited practising dietitians and is co-funded by Horticulture Innovation Australia (HIA) with co-investment from members of the Australian Tree Nut Industry supply chain and funds from the Australian Government.

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