

Dietary Fat and Heart Healthy Eating

Position Statement

This position statement summarises the contemporary evidence relating to dietary fat intake and cardiovascular health and draws on existing guidelines, and the characteristics of the Australian population and food supply to make recommendations.

The role of dietary fat intake and heart health is encompassed in the Heart Foundation's position on food and nutrition which recognises healthy eating patterns do not rely on one type of food or one type of nutrient to promote heart health.³ Heart healthy eating patterns are based on a combination of foods, chosen regularly, over time. This optimal combination can be categorised into five healthy eating principles:

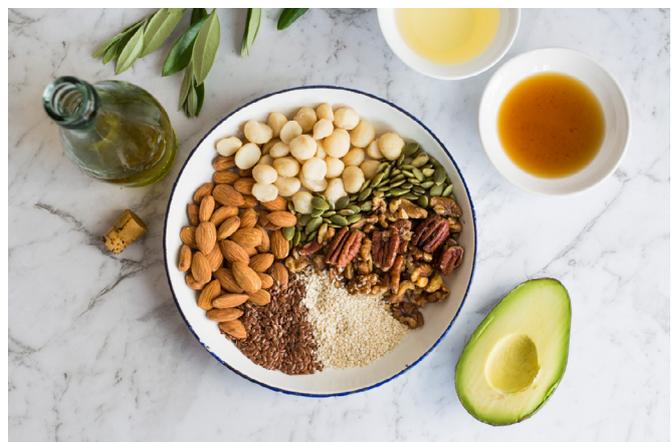
1. Plenty of vegetables, fruits and wholegrains
2. Variety of healthy protein sources including fish and seafood, lean meat and poultry, legumes, nuts and seeds
3. Reduced fat dairy such as unflavoured milk, yoghurt and cheese
4. Healthy fat choices with nuts, seeds, avocados, olives and their oils for cooking
5. Herbs and spices to flavour foods, instead of adding salt

**Water as the drink of choice

This style of eating is naturally **low in saturated and trans fats**, salt and added sugar and **rich in unsaturated fats** (MUFA, omega-3 PUFA, and omega-6 PUFA), along with wholegrains, fibre, and antioxidants. Eating this way will improve the heart health of all Australians by reducing CVD risk factors such as high blood pressure and blood lipids and decreasing the risk of CVD events and mortality.

The Heart Foundation commissioned a review of the scientific evidence relating to dietary fat intake and heart health¹ and dietary patterns and heart health.² These reviews inform the Heart Foundation's position on dietary fats for heart health outlined here, and the Heart Foundation's broader position on dietary patterns.³

The combined evidence suggests that whole diet changes, not altering one nutrient, is required to promote cardiovascular health.^{1,2} Replacing energy intake from saturated fat with energy from polyunsaturated fat (PUFA), monounsaturated fat (MUFA) and wholegrains is associated with a lower risk of a heart disease.¹ A greater risk reduction is observed when saturated fat is replaced with PUFA (including omega-3 and omega-6 PUFA), followed by MUFA, and to a lesser extent wholegrains. Replacing energy from saturated fat with non-wholegrain carbohydrates (i.e. refined carbohydrates including sugar) does not lower cardiovascular risk, and in some studies is associated with a greater risk. Both naturally occurring and ruminant trans fat increase cardiovascular risk.



BACKGROUND

Australians need to significantly change their current eating patterns to improve heart health. Most adults are not meeting the Australian Dietary Guidelines' recommendations for any of the five Food Groups.^{4,5} Discretionary foods are estimated to account for 35% of the average Australian adult daily energy intake.⁶ These foods, as a whole group, are the leading contributors to intakes of **saturated fat and trans fat**, free sugar, sodium and alcohol intake.^{5,6} This imbalance between foods promoted in the Heart Foundation's Healthy Eating Principles and current eating patterns in which discretionary food and drinks are a prominent feature, means current Australian eating patterns are a leading risk factor for death and disability in Australia.⁷

For Australian adults (aged 19 years and over), current eating patterns contribute on average 31% of energy from total fat, 12% from saturated and trans fat combined, 12% from MUFA, 4% from linoleic acid (an omega-6 PUFA) and <1% from alpha-linolenic acid (an omega-3 PUFA).⁶ Mean intake of long chain omega-3 PUFA (LC omega-3 PUFA includes combined eicosapentaenoic acid [EPA] and docosahexaenoic acid [DHA]) is 260mg/day for men and 180-240mg/day for women.⁸ Most Australians have **intakes of linoleic acid (LA), LC omega-3 PUFA and alpha-linolenic acid (ALA) below recommended targets**, and **combined saturated and trans fat intakes above recommended targets**.^{9,10}

Aboriginal and Torres Strait Islander people surveyed in the Australian Aboriginal and Torres Strait Islander Health Survey 2012-13 reported eating patterns which resulted in similar dietary fat intakes, with small but statistically significant differences with slightly higher intakes of saturated fat and lower intakes of LA.¹¹

In an analysis of 2011–2012 National Nutrition and Physical Activity Survey, the majority of Australian adults achieve the WHO guidelines of <1% energy intake from trans fat with a small proportion - around 1 in ten - exceeding this level.^{12,13} This is lower than other countries such as Brazil, Canada, Iran, Netherlands, United Kingdom (UK) and the United States. A social-economic gradient exists for trans fat consumption in Australia. This means more people from low income and education backgrounds do not meet the WHO guideline - around 1 in 7 - which indicates inequity in trans fat intake in Australia.¹³ This pattern of inequity is similar to other countries, including the UK.¹⁴

EVIDENCE FOR DIETARY FATS AND HEART HEALTH

The Heart Foundation commissioned a review of the scientific evidence relating to dietary fat intake and heart health. The Evidence Review: Dietary Fats and Cardiovascular Disease (Clifton & Keogh 2017)¹ informs the Heart Foundation's position on dietary fats for heart health, and the Heart Foundation's broader position on dietary patterns.

Clifton and Keogh (2017) evaluated information on dietary fats and cardiovascular health from 53 studies published since January 2010, including 44 systematic reviews and 9 individual studies not included in the latest meta-analysis, using the National Health and Medical Research (NHMRC) framework.^{1,15} For evidence relating to dietary fat consumption and the incidence of cardiovascular disease, the majority of available evidence were prospective cohort studies, and systematic reviews and meta-analysis of these studies. Both prospective cohort studies and interventional trials were available for studies in people with existing cardiovascular disease, albeit a lower number and quality.

The Evidence Review: Dietary Fats and Cardiovascular Disease found replacing energy intake from saturated and trans fat, with energy from PUFA, MUFA and wholegrains is associated with a lower risk of coronary heart disease (CHD), and the combined evidence suggests that whole diet changes, not just altering one nutrient, is required to promote cardiovascular health outcomes.¹ This aligns with the findings of the Evidence Review: Dietary Patterns and Cardiovascular Health commissioned by the Heart Foundation.² In practice, evidence supports eating patterns with less discretionary foods (including meat-derived and snack-derived saturated fat) replaced with the foods promoted in the Heart Foundation's Healthy Eating Principles.

Replace energy from saturated fat with unsaturated fats and wholegrain carbohydrates.

The Evidence Review found when considering changes to dietary fat intake, proportional energy change is important.¹ Replacing energy intake from saturated fat with energy from PUFA and MUFA is associated with a

lower risk of a CHD event and total mortality, with a greater risk reduction observed for PUFA (including linoleic acid and omega-3 LCPUFA), and to a lesser extent wholegrains. Replacing energy intake from saturated fat with energy from wholegrains is associated with a lower risk of CHD events, while replacing with non-wholegrain carbohydrates (i.e. refined carbohydrates including sugar) was associated with an increased risk.

This demonstrates poor quality carbohydrates (i.e. refined carbohydrates including sugar) may confer a similar amount of cardiovascular risk as saturated fat. This finding explains the 'neutral' or 'no' associations seen in reviews of the relationship between saturated fat and cardiovascular health when replacement with unsaturated fat has not been considered.

Limit trans fat intake

In all studies reviewed, trans fat intake was associated with an increased risk, incidence and mortality from heart disease.¹ There is not strong or consistent evidence that ruminant trans fat and industrially-produced trans fat affect cardiovascular risk differently.^{1, 16, 17} Current recommendations are that total trans fat, both ruminant and industrially-produced, be limited to less than 1% of total energy. Limiting discretionary foods, and choosing reduced fat dairy products and lean meat, along with introducing a variety of protein foods including fish, legumes, poultry, and nuts, and using healthier plant-based oils in food preparation help to limit trans fat intake (both ruminant and industrially produced) to less than the World Health Organization's recommended 1% of total energy.

Include food sources of Omega-3 PUFA

Nestel et al (2015) assessed the evidence for omega-3 PUFA consumption and cardiovascular health published between 2007 and 2013, using the NHMRC framework, in relation to fish consumption and omega-3 PUFA supplementation.¹⁸ This built on a previous review (Colquhoun et al. 2008) which assessed evidence up to 2007.¹⁹ The Evidence Review by Clifton & Keogh (2017) did not find any additional evidence to change the existing conclusions from Nestel et al (2015).¹ The Heart Foundation recommends an optimal range of between 250-500mg combined EPA and DHA per day based observational studies demonstrating a 'threshold of effect' in this range.^{18,20} Including fish and seafood 2-3 times per week is recommended, as part of the Heart Foundation's Healthy Eating Principles, to achieve this target. Higher intake of ALA was associated with reduced risk of CHD death in the setting of primary prevention.^{1,18} The evidence supports including sources of ALA in the diet but not for supplementation.¹⁶ High ALA intake likely reflects intake of soybean oil, canola oil and walnuts, so other components of these foods beside ALA may confer benefit.¹⁸

Studies of LC omega-3 PUFA supplements in people without heart disease did not find a clear benefit for reducing their risk of developing heart disease.¹⁸ However, evidence suggested that LC omega-3 PUFA supplements with 1g combined EPA and DHA can play a beneficial role in the treatment of patients with high triglyceride levels and in patients with heart failure. These recommendations align with international guidelines, including the European Society of Cardiology, the National Institute of Clinical Excellence, the American Heart Association and the American College of Cardiology.¹⁸

Include food sources of Omega-6 PUFA

In studies specific to linoleic acid (LA), a type of omega-6 PUFA, replacing energy from saturated fat or carbohydrate with energy from LA was associated with a lower risk of CHD events and death.¹ In a meta-analysis of cohort studies, high (median intake 7.7%) compared to low (median intake 1.1%) of energy from LA was associated with a 15% lower risk of CHD (pooled RR, 0.85; 95% CIs: 0.78–0.92) and 21% lower risk of CHD mortality (RR, 0.79; 95% CI, 0.71–0.89).²¹ A Cochrane systematic review of 13 interventions found if saturated fat was replaced by PUFA, there was a 27% reduction in cardiovascular events.²² These



findings demonstrate a relationship between the replacement of energy from saturated fat with omega-6 PUFA and a lower risk of heart disease.¹ This supports the findings of the American Heart Association's scientific statement on omega-6 which found omega-6 fats are associated with a reduced risk of heart disease and when consumed within existing guidelines (4-10%) are not pro-inflammatory.²³ Food sources of omega-6 PUFA include nuts and seeds and their oils (including sunflower, sesame, canola and to a lesser extent olive oils).

Blood cholesterol and lipoprotein changes related to dietary fat intake

The impact of saturated and trans fat intake, in short-term interventions, have been recently reviewed by the World Health Organisation.^{16,24} These reviews found replacing 1% energy from saturated fat with energy from PUFA lowered low density lipoprotein (LDL-C) (-0.055 [-0.061 to -0.051]), followed by MUFA (-0.042 [-0.047 to -0.037]), then carbohydrate -0.033mmol/L [95%CI -0.039to -0.027]).²⁴ Similar changes were found when replacing trans fat; when industrial trans was replaced by MUFA (13 studies) LDL cholesterol was lowered by -0.034 (-0.042 to -0.17) while replacement of ruminant trans (4 studies) by cis-MUFA lowered LDL by -0.052 (-0.097 to -0.006) for 1% of energy exchanges.¹⁶ Clifton & Keogh (2017) found no evidence that elevating high density lipoprotein (HDL) cholesterol by dietary means is related to CHD outcomes.¹ The LDL-cholesterol-lowering effect of both plant sterols and stanols continues to increase up to intakes of approximately 3 g/day to an average effect of 12 %.²⁵ The intake of naturally occurring plant sterols in the diet is on average 200-400 mg daily.²⁶ The balance of evidence indicates that when eaten at the recommended amount, between 2 and 3 grams a day, plant sterols can reduce low-density lipoprotein (LDL) cholesterol levels. This should be in addition to a heart healthy diet and/or medications, not a substitute for.

For evidence on the longer-term impact of improving blood cholesterol and lipoproteins, the Evidence Review: Dietary Patterns and Cardiovascular Health found good evidence for dietary patterns including the Portfolio diet (Level B, secondary prevention), DASH and low fat diets (Level B, primary and secondary prevention), the Mediterranean diet (Level C, primary prevention) and low GI, Mediterranean, Nordic and high protein diets (Level C, primary and secondary prevention) in reducing total and LDL cholesterol compared to control diets.²

Dairy, saturated fat, and heart health

A particularly topical area is the role of specific saturated fat containing foods and cardiovascular health, including dairy products.

Dairy foods are good sources of protein and calcium and can be a part of a healthy eating pattern. Reduced-fat dairy has been associated with a reduced risk for some, but not all, cardiovascular risk factors, such as high blood pressure and LDL Cholesterol.^{1,27} In addition, replacing saturated fat from dairy with unsaturated fat (PUFA and MUFA) is likely to be associated with a reduced risk of heart disease.¹ This, combined with the evidence from Collins et al (2017)², suggests reduced-fat unflavoured dairy is preferred over full-fat dairy, as part of a heart healthy eating pattern.



Conclusions

Replacing energy intake from saturated fat with energy from PUFA, MUFA and wholegrain carbohydrates is associated with a lower risk of a CHD event and total mortality. A greater risk reduction is observed when saturated fat is replaced with PUFA (including omega-3 and omega-6 PUFA), followed by MUFA, and to a lesser extent wholegrains. Replacing energy from saturated fat with non-wholegrain carbohydrates (i.e. refined carbohydrates including sugar) does not lower cardiovascular risk, and in some studies is associated with a greater risk. Both naturally occurring and ruminant trans fat increase cardiovascular risk. These conclusions support the Heart Foundation recommendations to replace energy from saturated fat with energy from PUFA and MUFA, and to choose wholegrain carbohydrate foods. Changes to dietary fat intake will influence serum cholesterol changes, but these need to be considered (and indeed promoted) as part of a wider eating pattern.

The Heart Foundation's Heart Healthy Eating Principles promote the key features of the variety of dietary patterns including Mediterranean and DASH diets. The Heart Healthy Eating Principles translate the conclusions and recommendations from Heart Foundation's evidence summaries^{1,2,18,25}, the National Health & Medical Research Council^{4,10}, the World Health Organisation^{16,17,24}, along with the American Heart Association^{23,28} which recommend the shift from saturated to unsaturated fat should occur within a healthy dietary pattern.

Suggested changes at individual, food supply and policy level

The Heart Foundation supports existing nutrient targets set by NHMRC¹⁰ and WHO^{16,17,24}. There is no evidence to suggest changes are required to existing nutrient targets, however the promotion of dietary patterns and food-based messages is required to shift current eating patterns in a manner which is more beneficial for cardiovascular health.

Nutrient	Target	Source
Saturated fat	<10% of total energy, on average	NHMRC ¹⁰ , WHO ^{17,24}
Omega-3 polyunsaturated fat Combined EPA/DHA ALA	250-500mg per day 1 gram per day	NHMRC ¹⁰ , Heart Foundation ^{18,20}
Omega-6 polyunsaturated fat	4-10%	NHMRC ¹⁰ , American Heart Association ^{23,28} , WHO ¹⁷
Total trans fat	<1% of total energy, on average	WHO ^{16,17}

Changes to individual eating patterns

The evidence review demonstrated that proportional energy change of dietary fats is important, however the challenge is translating 'replacement' and 'reduction' nutrient messages into practical advice. At an individual level, for both primary and secondary prevention of heart disease, the evidence suggests that people should eat less discretionary foods – which are the leading contributors to saturated fat, trans fat, sodium and free sugar intakes - and replace them with a mix of fish and seafood, wholegrains, vegetables, fruit, nuts and seeds, and healthy oils. Reducing discretionary food intake would contribute to healthier eating patterns, and assist in achieving nutrient targets, particularly for those sub-groups with higher intakes. For people with existing heart disease, or at high risk, the following are nutrient-specific recommendations in addition to a heart healthy eating pattern:

- for people with heart failure, there is modest support for 1 gram of omega-3 LCPUFA supplementation in addition to standard therapy,^{18,20}
- in people with hypertriglyceridaemia, consider up to 4,000–5,000 mg of EPA and DHA per day as the highest dose alone or with a fibrate for moderately severe hypertriglyceridaemia^{18,20}
- for people with high absolute risk of heart disease, and who require blood cholesterol lowering interventions, 2–3 g of plant sterols per day from fortified food products (currently margarine, milk, yoghurt and breakfast cereals) will assist in lowering LDL cholesterol levels.²⁵

Policy changes to the food supply which support healthy eating patterns

Government and food industry can implement labelling and reformulation programs to assist in improving the profile of commonly consumed processed foods and thus population intakes of dietary fats. This must be accompanied by programs and interventions which also shift eating patterns away from discretionary and highly processed foods. To assist in continuing to remove industrially-produced trans fat from the Australian food supply - trans fat (both ruminant and industrially-produced) should be labelled on packaged food products over a specific level, measures taken to phase out ingredients with industrially-produced trans fat and ongoing monitoring with 3 yearly surveys of the Australian food supply. Modelling suggests that trans fat from ruminant sources contributes to about 60-75% of total trans fat intake in Australia, in comparison to ranges between 28-79% in other countries.²⁹ This indicates industrially-produced trans fat continues to be present in the Australian food supply, albeit it in smaller quantities than other countries. Voluntary reformulation of trans fat in the Australian food supply over the past 30 years has contributed to low average intakes of total trans fat however surveys indicate industrially-produced trans fat continues to be present in common supermarket items.²⁹ The Heart Foundation recommends trans fat (both ruminant and industrially-produced) is labelled on packaged food products and that industrially-produced trans fat is phased out of the Australian food supply.

RECOMMENDATIONS



Based on the evidence for dietary patterns and the evidence for dietary fat intake and cardiovascular health outcomes, the Heart Foundation recommends:

1. A dietary patterns approach to communicating and promoting healthy eating messages which encompass recommendations for recommended nutrient intakes, including dietary fat.³ Rather than focusing on individual nutrients, we encourage Australians to follow the Heart Foundation's Heart Healthy eating principles which includes:

1. Plenty of vegetables, fruits and wholegrains
2. Variety of healthy protein sources including fish and seafood, lean meat and poultry, legumes, nuts and seeds
3. Reduced fat dairy such as unflavoured milk, yoghurt and cheese
4. Healthy fat choices with nuts, seeds, avocados, olives and their oils for cooking
5. Herbs and spices to flavour foods, instead of adding salt

**Water as the drink of choice

2. Due to the demonstrated relationships between specific dietary fats and cardiovascular health outcomes and risk, the Heart Foundation supports existing nutrient targets as set by NHMRC and WHO that trans fat <1% total energy intake, saturated fat <10%, linoleic acid between 4-10%, LC omega-3 (combined EPA and DHA) between 250-500 mg per day, and 1g ALA per day.
3. Health professionals can consider supplementing nutrition therapy with LC omega-3 PUFA (combined EPA & DHA) in people with heart failure and people with high triglycerides, and plant sterol enriched foods in people with high absolute risk who required cholesterol lowering therapies.
4. Government and food industry can implement labelling and reformulation programs to assist in improving population intakes of dietary fats, mandatory labelling of trans fat and ongoing monitoring of industrially-produced trans fat in the Australian food supply. This must be accompanied by programs and interventions which also shift eating patterns away from discretionary and highly processed foods.

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- Food and Nutrition Advisory Committee of the National Heart Foundation of Australia
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- Garry Jennings

RELATED DOCUMENTS

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