

Fish and omega-3: Questions and answers

The Heart Foundation recommends all Australians should aim to include 2–3 serves of fish (including oily fish) per week as part of a heart-healthy diet. This provides around 250–500 milligrams (mg) of marine-sourced omega-3s (EPA, DHA) per day. The Heart Foundation also recommends all Australians should aim for 1 gram of plant-sourced omega-3 (ALA) each day.

Marine-sourced and plant-sourced omega-3s should be included as part of a heart-healthy diet that includes vegetables and legumes, fruit, wholegrain cereals, lean meats and their alternatives, fish, nuts and seeds, reduced fat milk, cheese and yoghurt, healthier fats and oils, and limits salt.

Key messages

Fish

- The Heart Foundation recommends all Australians should aim to include 2–3 serves of fish (including oily fish) per week as part of a heart-healthy diet. This provides around 250–500 mg of marine-sourced omega-3s (EPA, DHA) per day.
- Because our bodies cannot produce omega-3s we need to source them through our diet. The scientific evidence supports fish as the best dietary source of omega-3s and found higher fish intake was consistently associated with lower rates of heart disease (heart failure and sudden cardiac death) and stroke.
- Fish with the highest levels of omega-3 include salmon, blue-eye trevalla, blue mackerel, herring, canned sardines, canned salmon and some varieties of canned tuna. Other good sources of marine-sourced omega-3s include barramundi, bream, flathead, squid, scallops and mussels.
- To find out more about sources of omega-3 and how to include it in your diet, refer to the Heart Foundation resources *Tips to include marine-sourced omega-3s in your diet* and *Sources of omega-3*.

Omega-3 supplements (EPA, DHA)

- Supplements will provide people who do not eat fish with some level of marine-sourced omega-3s.
- If you have high triglyceride levels, your health professional may consider using omega-3 supplements (containing EPA and DHA) to help lower triglyceride levels.
- If you have heart failure, your health professional may recommend using omega-3 supplements (containing EPA and DHA) in addition to standard medications.

Plant-sourced Omega-3 (ALA)

- The Heart Foundation recommends that all Australians should aim for 1 gram of plant-sourced omega-3s (ALA) each day.
- Plant-sourced omega-3s are related, but slightly different, to marine-sourced omega-3s however both types are important parts of a heart-healthy diet. Sources of ALA omega-3 includes walnuts, linseed/flaxseed, chia seeds and oils such as canola and soybean.

Heart Foundation recommendations

What does the Heart Foundation recommend for heart health?

The Heart Foundation recommends all Australians should aim to eat 2–3 serves of fish, including oily fish, per week. This provides about 250–500 mg/day of marine-sourced omega-3s (EPA, DHA).

The Heart Foundation recommends that Australian adults also aim for 1 gram per day of plant-sourced omega-3 (ALA). Good sources of ALA include walnuts linseeds/flaxseeds, chia seeds and canola and soybean oils.

Marine-sourced and plant-sourced omega-3s should be included as part of a heart-healthy diet that includes vegetables and legumes, fruit, wholegrain cereals, lean meats and their alternatives, fish, nuts and seeds, reduced fat milk, cheese and yoghurt, healthier fats and oils, and limits salt.

Do these recommendations differ from previous Heart Foundation recommendations?

Our recommendations have been updated based on the outcomes of our 2015 clinical review of the most up-to-date and credible scientific evidence, which is available at [www.heartlungcirc.org/article/S1443-9506\(15\)00167-5/abstract](http://www.heartlungcirc.org/article/S1443-9506(15)00167-5/abstract).

The clinical review found higher fish intake was consistently associated with lower rates of sudden cardiac death, stroke, heart failure and myocardial infarction (heart attack). Studies of omega-3 supplements in people without heart disease did not find a clear benefit for reducing their risk of developing heart disease. The review found evidence that omega-3 supplements can play a beneficial role in the treatment of people with high triglycerides and in those with existing heart disease (specifically heart failure).

As a result, we have strengthened our recommendation that Australian adults should eat 2–3 serves of fish per week to reduce their risk of developing heart disease. It is the standalone, preferred source of marine-sourced omega-3s (EPA, DHA). The clear message is that eating fish is the best way to achieve the recommended daily level of marine-sourced omega-3.

The recommendation for plant-sourced omega-3s (ALA) remains, and the amount has been adjusted to a level consistent with the National Health and Medical Research Council (NHMRC) advice of 1 gram of ALA per day.

Does the Heart Foundation still recommend fish oil supplements to meet the daily requirements for omega-3s?

We recommend that eating food – including 2–3 serves of fish per week and 1 gram per day of plant-sourced omega-3 – is the best way to ensure you get the recommended levels of omega-3s in your diet to reduce the risk of heart disease.

Supplements will provide people who do not eat fish with some level of marine-sourced omega-3s (EPA, DHA).

If you have high triglyceride levels, your health professional may recommend using omega-3 supplements (containing EPA, DHA) to reduce triglyceride levels. If you have heart failure, your health professional may recommend using omega-3 supplements (containing EPA, DHA) in addition to your other heart failure recommendation.

How do the Heart Foundation's recommendations compare with those of other health authorities?

The Heart Foundation's recommendations for fish consumption are consistent with the *Australian Dietary Guidelines* and those of Food Standards Australia and New Zealand (FSANZ), the American Heart Association (AHA) and the World Health Organization (WHO).

Our recommendations for omega-3 supplements align with international guidelines, such as the European Society of Cardiology, the National Institute of Clinical Excellence (NICE) and the AHA and the American College of Cardiology. These guidelines do not advise routine recommendation of omega-3 supplements for heart health by health professionals, but do recommend the use of omega-3 supplements for those with high triglyceride levels and as an additional treatment for heart failure.

Where can I get more information on omega-3s for heart health?

The Heart Foundation has developed resources for the community on fish and omega-3 for heart health, which are available on our website at www.heartfoundation.org.au

- *Sources of omega-3* – An overview of common sources of omega-3s.
- *Tips to include marine-sourced omega-3s in your diet* – This resource provides options to include fish in your weekly meals to meet a goal intake of 250–500 mg of marine-sourced omega-3s (EPA, DHA) per day.
- Recipe database – Visit www.heartfoundation.org.au/recipes to check out our range of fish recipes and meal ideas for fresh, frozen and tinned fish.

For more information, please contact the Heart Foundation's Health Information Service on 1300 36 27 87 (for the cost of a local call), email health@heartfoundation.org.au or visit www.heartfoundation.org.au.

Recommendations for specific groups

What are the current recommendations for fish and omega-3s for people without heart disease?

Omega-3s are essential fatty acids that need to be sourced from food as the body doesn't make them. The Heart Foundation recommends people aim for 250–500 mg per day of marine-sourced omega-3s (EPA, DHA) and 1 gram of plant-sourced omega-3s (ALA).

The Heart Foundation recommends the best way to reach these targets is through a heart-healthy diet including 2–3 serves of fish per week, and a variety of nuts, seeds and oils including soybean, canola, flaxseed/linseed, chia seeds and walnuts.

What is a heart-healthy diet?

The Heart Foundation recommends that fish and sources of ALA should be included as part of a heart-healthy diet which includes vegetables and legumes, fruit, wholegrain cereals, lean meats and their alternatives, fish, nuts and seeds, reduced fat milk, cheese, and yoghurt, healthier fats and oils, and limits salt.

What are the current recommendations for people at high risk of heart disease?

The Heart Foundation recommends people at high risk of heart disease should aim for 250–500 mg per day of marine-sourced omega-3s (EPA, DHA) and 1 gram of plant-sourced omega-3 (ALA).

The Heart Foundation recommends the best way to reach these targets is through a heart-healthy diet including 2–3 serves of fish per week, and a variety of nuts, seeds and oils including soybean, canola, flaxseed/linseed, chia seeds and walnuts.

If you have high triglyceride levels (a type of fat in your blood), your health professional may recommend using omega-3 supplements to help reduce triglyceride levels.

What are the current recommendations for people with existing heart disease?

The recommendations for people with existing heart disease are the same. They should aim to eat 2–3 serves of fish (including oily fish) per week, which provides 250–500 mg/day of marine-sourced omega-3 (EPA, DHA). They should also aim to include 1 gram per day of plant-sourced omega-3 (ALA). Good sources of ALA include walnuts, linseeds/flaxseeds, chia seeds and canola and soybean oils.

Marine-sourced and plant-sourced omega-3s should be included as part of a heart-healthy diet that includes vegetables and legumes, fruit, wholegrain cereals, lean meats and their alternatives, fish, nuts and seeds, reduced fat milk, cheese, and yoghurt, healthier fats and oils, and limits salt.

If you have high triglyceride levels (a type of fat in your blood), your health professional may recommend using omega-3 supplements to help reduce triglyceride levels.

If you have heart failure, your health professional may recommend using omega-3 supplements in addition to your other heart failure medications.

What are the recommendations for pregnant women or breastfeeding women?

The Heart Foundation advises all Australian adults aim to eat 2–3 serves of fish per week, and follow the advice from FSANZ on mercury in fish.

FSANZ recommends 2–3 serves per week of any fish, EXCEPT the following, which should be eaten infrequently:

- 1 serve per week of orange roughy (deep sea perch) or catfish and no other fish that week
- 1 serve per fortnight of shark (flake) or billfish (swordfish/broadbill or marlin), and no other fish that fortnight.

Current Heart Foundation guides for seafood and recipes do not list any species that have a higher risk of mercury contamination (e.g. flake, swordfish and orange roughy).

What are the recommendations for children?

The Heart Foundation makes recommendations for Australian adults to reduce the risk of heart disease. The Heart Foundation supports the National Health and Medical Research Council (NHMRC) recommendation for food and nutrient intake for children.

According to the *Australian Dietary Guidelines and Nutrient Reference Values for Australia and New Zealand*, one small serve (100 grams) of a fish such as flathead, plus two small cans of sandwich tuna a week, will provide a child up to age 14 with an adequate intake of omega-3s.

Are there other health benefits, apart from reducing the risk of heart disease, from consuming fish or omega-3s?

Yes. The focus of our scientific review was heart health and, as such, the Heart Foundation recommendations are specific to heart health. The *Australian Dietary Guidelines* reviewed the evidence for general health and to reduce the risk of other chronic diseases. Please refer to these guidelines for further information, www.eatforhealth.org.au

Omega-3 food sources

The Heart Foundation has a guide to different foods that contain marine-sourced (EPA, DHA) and plant-sourced (ALA) omega-3s. In summary:

- Good sources of marine-sourced omega-3s include salmon, blue-eye trevalla, blue mackerel, herring, canned sardines, canned salmon and some varieties of canned tuna.
- Good sources of plant-sourced omega-3s include walnuts, linseed/flaxseed, chia seeds and oils such as canola and soybean.

How much fish does an adult need to eat each week to meet the Heart Foundation's recommendations?

To reach the Heart Foundation's recommendations, you might need to make small changes to your diet to include fish.

There are many good options for marine-sourced omega-3, including salmon, blue-eye trevalla, blue mackerel, herring, canned sardines, canned salmon and some varieties of canned tuna.

An adult can reach the recommended intake of 250–500 mg of marine-sourced omega-3s (EPA, DHA) by following any of the options described in *Tips to include marine-sourced omega-3s in your diet*.

As a general rule, 2–3 serves of fish per week will provide adequate omega-3s for heart health. A serve of fish is around 150 grams.

How do I meet the Heart Foundation's recommendations for plant-sourced omega-3s?

To reach the 1 gram of plant-sourced omega-3s (ALA) per day recommendation, you might need to make small changes to your current diet to include plant-based oils, nuts and seeds. Our guide, *Sources of omega-3*, provides suggestions on how to include ALA in a heart-healthy diet. A general guide is that a handful of walnuts or using soybean or canola oil or spreads will provide around 1 gram of ALA per day.

I am a vegetarian and I do not wish to include fish or meat in my diet. How can I get my recommended allowance of omega-3s?

Plant-sourced omega-3s (ALA) are found in canola and soybean-based fats and oils, nuts (particularly walnuts), linseeds (flaxseeds) and chia seeds, and are suitable for vegetarians and vegans.

It is still important to include marine-sourced omega-3s (EPA, DHA) in your diet as the conversion from ALA to EPA and DHA is only modest. You should consider alternative options to fish to get your recommended levels of marine-sourced omega-3s. Marine sources of omega-3 originate in algae, which is then eaten by various seafood species along the fish food-chain. Some omega-3 supplements are derived from algae and are suitable for use by vegetarians and vegans to include marine-sourced omega-3s in their diet.

I'm concerned about the salt levels in some varieties of canned and smoked fish and seafood. What are the alternatives?

You can try fresh fish and seafood, or look for frozen or canned fish and seafood that are salt reduced. Fresh fish and seafood, and fish and seafood canned in spring water or oil contains far less salt than fish and seafood that has been smoked or canned in brine.

Some flavoured varieties of canned fish and seafood have higher omega-3 levels, so look for higher levels of EPA and DHA on the label. It is also worth noting that 'low fat' or 'lite' canned fish and seafood may have lower omega-3 levels.

Does it matter how the fish is cooked?

Yes. The heart health benefits of eating fish depend on how it is prepared. For example, deep frying fish can destroy omega-3s. Further, deep fried fish is also often cooked in unhealthy fats and will not provide heart health benefits.

When eating or preparing fish, choose cooking methods such as steaming, grilling, light pan-frying, baking, barbequing or even raw fish such as sushi or sashimi. You can add fish to stir-fries, casseroles, pasta and soups, or simply have it in a sandwich or in a salad. For recipes and further information, visit the Heart Foundation website at www.heartfoundation.org.au/recipes

Be mindful that flake is commonly served at takeaway seafood restaurants and this species is a high risk for methylmercury contamination. FSANZ and the Heart Foundation recommend infrequent consumption of fish species at high risk for mercury contamination, such as flake.

My family will only eat a particular type of fish. Is this ok or do I need to include salmon?

You do not need to include salmon. There are other fish types that are good sources of omega-3s. You can cook and serve a variety of fish to ensure your family members receive 2–3 serves per week. For information, including sources of omega-3 (EPA, DHA, ALA) and recipes, visit our website at www.heartfoundation.org.au/recipes

Fresh fish and seafood can be expensive. How feasible is this recommendation for people on a tight budget?

The Heart Foundation recognises that fish and seafood can be expensive, so you need to choose varieties that best suit your budget and lifestyle. Canned fish and seafood are convenient and accessible for most people, and allow you to add more fish to salads, sandwiches and other meals. You should choose reduced salt versions or look for the Heart Foundation Tick. Frozen fish is just as nutritious, but you should avoid battered and crumbed varieties which add unnecessary kilojoules and salt to the meal. You can check out *Tips to include marine-sourced omega-3s in your diet* and our recipes for some inspiration when you're on a budget at www.heartfoundation.org.au/recipes

What if you live in a rural area and can't access fresh seafood?

Canned salmon, sardines and tuna, along with frozen fish, are suitable substitutes for fresh seafood. You should choose reduced salt versions or look for the Heart Foundation Tick. Check out *Tips to include marine-sourced omega-3s in your diet* and our recipes for some inspiration at www.heartfoundation.org.au/recipes

Omega-3 supplements

Does the Heart Foundation recommend omega-3 supplements?

The Heart Foundation recommends all Australians aim for 2–3 serves of fish (including oily fish) per week from food sources. There are specific groups of people at high risk of heart disease or living with heart disease who may benefit from omega-3 supplementation. If you don't eat fish or seafood, supplements can provide marine-sourced omega-3s (EPA, DHA) to your diet.

Does this mean omega-3 supplements should not be used as a substitute for eating fish?

There is no substitute for a heart-healthy diet. The scientific evidence assessed as part of our clinical review found higher fish intake was consistently associated with lower rates of sudden cardiac death, stroke, heart failure and myocardial infarction (heart attack). The evidence is not consistent for omega-3 supplements in people without heart disease.

Accordingly, the Heart Foundation's headline recommendation is for Australian adults to eat 2–3 serves of fish per week to meet your nutrient requirements. Supplements can provide people who do not eat fish with some level of marine-sourced omega-3s.

Are there any benefits in using omega-3 supplements for heart health?

If you do not eat fish, supplements will provide some level of marine-sourced omega-3s.

Health professionals may consider omega-3 supplements for people with high triglyceride levels (a type of fat in the blood) and people with heart failure.

Is there any evidence that omega-3 supplements are harmful?

No. This is why we recommend that omega-3 supplements be considered by health professionals as part of a broader treatment strategy for people with high triglyceride levels or with heart failure. Omega-3 supplements provide some level of marine-sourced omega-3s to people who don't eat fish.

Are supplements like krill oil or calamari oil beneficial?

Marine sources of omega-3 originate in algae, which is then eaten by various seafood species along the fish food-chain. Thus marine sources of omega-3 (EPA, DHA) can be found in a variety of foods and supplements such as algal oil, krill oil, calamari oil and fish oil. There is no compelling evidence that one type of marine-sourced omega-3 is better than another. However, the varying types of oil products vary dramatically in level of marine-sourced omega-3 (EPA, DHA) and price.

Which supplements does the Heart Foundation recommend?

We don't recommend a particular supplement. We suggest that you read the labels on supplements or consult with your local pharmacist or health professional to identify supplements best suited to your needs. The price of supplements usually varies based on the level of EPA and DHA in each capsule.

Mercury

Should I be concerned about mercury levels in fish?

The evidence is clear that the health benefits of eating fish far outweigh any risks. The Heart Foundation recommends fish and seafood that has safe mercury levels and our recommendations align with advice from FSANZ.

FSANZ recommends 2–3 serves per week of any fish, EXCEPT the following, which should be eaten infrequently:

- 1 serve per week of orange roughy (deep sea perch) or catfish and no other fish that week
- 1 serve per fortnight of shark (flake) or billfish (swordfish/broadbill or marlin), and no other fish that fortnight.

Current Heart Foundation guides for seafood and recipes do not list any species that have a higher risk of mercury contamination (e.g. flake, swordfish and orange roughy).

The level of mercury in most fish that are caught and sold in Australia is low, which means you can continue to get the many benefits from eating fish without concern. The Therapeutic Goods Administration (TGA) requires all fish oil supplements sold in Australia to contain zero or near zero mercury levels.

For a list of recommended fish, refer to the list of resources at the beginning of this document.

Be mindful that flake is commonly served at takeaway seafood restaurants and this species is a high risk for methylmercury contamination. When eating away from home, be sure to ask about the species of fish and choose one of our recommended species.

Can I eat the fish I catch locally?

Yes, generally speaking. The risk of environmental contamination of fish caught in Australia is low. However we recommend checking with local government authorities to identify any specific recommendations for consuming fish in your area, because conditions vary.

People living in tropical reef areas with warm ocean waters, such as Queensland, the Northern Territory and Western Australia, need to be aware that some fish species in these areas (for example, coral trout and Spanish mackerel) have high levels of ciguatera. Ciguatera is a toxin commonly found in the flesh of progressively larger fish. If you eat just one large serve of infected fish, you can get ciguatera poisoning. Contact your state or territory food safety department for more information on ciguatera poisoning, and your state or territory government department for fisheries for more information on fishing in your area.

Sustainability

How can I choose sustainable fish and seafood?

While we recognise the importance of sustainability of our food supply, we cannot provide advice on sustainable fish and seafood choices as this is not our speciality area. The Heart Foundation focuses on reducing the risk of cardiovascular disease for all Australians. If you are interested in making sustainable fish and seafood choices, you should consult with other national guides for more information.

Definitions and acronyms

Omega-3

Omega-3 fatty acids are a type of polyunsaturated fat that, like other dietary polyunsaturated fats, reduce your risk of heart disease.

Omega-3s come from marine, animal and plant sources. The evidence for heart health is much stronger for marine-sourced omega-3s (EPA, DHA). While plant-sourced omega-3s (ALA) can be converted in our bodies to EPA and DHA, the conversion rate is low. Therefore it is important to include marine-sourced and plant-sourced omega-3s from a variety of foods as part of a heart-healthy diet.

Marine-sourced omega-3s (EPA, DHA) – Eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) are omega-3s that are found primarily in oily fish, such as salmon, blue-eye trevalla, blue mackerel, herring, canned sardines, canned salmon and some varieties of canned tuna. Other fish such as barramundi, bream or flathead, and seafood such as arrow squid, scallops and mussels, are also good sources of omega-3.

Plant-sourced omega-3s (ALA) – Alpha-linolenic acid (ALA) is derived from plants and is found mainly in plant-based fats and oils, such as canola oil and soybean oil, and linseeds (flaxseeds), chia seeds and walnuts.

Animal-sourced omega-3s – Docosapentaenoic acid (DPA), along with small amounts of EPA and DHA, is found in animal products, such as free range eggs, chicken and beef.

Polyunsaturated fats

Polyunsaturated fats are fats that have more than one double-bonded (unsaturated) carbon in the molecule. Polyunsaturated fats are one type of unsaturated fat and mono-unsaturated fat, which has only one unsaturated carbon in the molecule, is another.

There are two types of polyunsaturated fats that influence heart health, omega-3 and omega-6, and both are essential fatty acids. Refer to the Q&A *Dietary fats, dietary cholesterol and heart health* for further details on omega-6 polyunsaturated fats.

Essential fatty acids

Essentially fatty acids are fats that the human body requires but cannot make itself. The human body naturally produces saturated fat, cholesterol and monounsaturated fats, which means they are not essential parts of our diets. The human body cannot make omega-3 and omega-6 polyunsaturated fats naturally, and so these must be sourced from a healthy diet to avoid deficiency and are thus essential parts of our diets.

Acronyms

ALA – Alpha-linolenic acid

DHA – Docosahexaenoic acid

DPA – Docosapentaenoic acid

EPA – Eicosapentaenoic acid

Further information

For more information, please contact the Heart Foundation's Health Information Service on 1300 36 27 87 (for the cost of a local call), email health@heartfoundation.org.au or visit www.heartfoundation.org.au

You can access the evidence review and recommendations on omega-3 and cardiovascular disease, including omega-3 supplementation, at [www.heartlungcirc.org/article/S1443-9506\(15\)00167-5/abstract](http://www.heartlungcirc.org/article/S1443-9506(15)00167-5/abstract)

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