



New Zealand Seafood. The greatest meal on Earth.

Evidence suggests that eating
between 100–400g of seafood per
week may show health benefits



Seafood_{for} Health

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The Good Oil In Seafood

Eating Seafood

In the last decade, it has been observed that the consumption of two or more serves of seafood per week is associated with a lower prevalence of heart disease.

Increasingly, we are discovering other health benefits associated with regular consumption of seafood. Many of these benefits have been linked to the long-chain, highly polyunsaturated omega-3 fatty acids, eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), which are found in seafood. Seafood is also a good source of protein and trace elements.

Omega 3 Fatty Acids and the Inflammatory Pathway

The presence of omega-3 fats in the diet can suppress the production of prostaglandins required for the pro-inflammatory pathway.

The activation of the pro-inflammatory pathway is thought to lead to an inappropriate inflammatory response to common allergens e.g in asthma. Omega-3 fats allow the body to modify the inflammatory response, therefore causing less inflammation, less blood clotting and more vasodilation. This is seen in Inuit populations whose diet is predominantly fish and marine based plants and mammals.¹ Their blood clotting time is an average of 8 minutes – twice that of European populations.

In general, if a seafood species has a high oil content, it will provide a high level of Omega-3.

COOKING

Cooking does not appear to harm either the quality or quantity of beneficial omega-3 rich oils in seafood.

TINNED FISH

Finfish such as sardines, mackerel, herring and salmon do not lose their positive health benefits by being canned. However, most tuna has the fat drained before canning so may have half the fat (and hence omega-3) content of fresh tuna.

SEAFOOD SNACKING

If preferred, convenient, more affordable or culturally appropriate, smaller serving sizes of seafood can be used in a cumulative way for health over the day or over a few days. Examples would be sushi, marinated herrings or small tins of sardines or tuna.

Fish Oil Supplements

Fresh seafood is the preferred source of omega-3 fatty acids, but fish oil supplements are readily available. The evidence for many of the health benefits in this pamphlet comes from epidemiological data investigating fish consumption, not fish oil. The exception is the evidence in Crohn's disease, where high doses of fish oil were found to be beneficial. While the omega-3 fats are known to have a range of health benefits, seafood contains more than just the omega-3 nutrients, and will have many more positive health benefits as a whole.

Is It Safe?

Food safety is particularly important where foods contain animal proteins (e.g. poultry and dairy products, meats and seafood). Follow the food safety instructions given on any packs of these products (e.g. expiry dates, 'refrigerate after opening', etc) and practise safe food handling.

Fresh seafood should be kept refrigerated and should be eaten within two days of purchase.

Listeriosis is a particular concern for pregnant women as it may cause miscarriage and stillbirth. Listeria will grow on refrigerated food, so careful food handling is necessary.



HEAVY METALS AND OTHER TOXINS

The health hazards associated with eating fish contaminated with heavy metals such as mercury have received worldwide publicity. However, health problems only arise where the fish are feeding in waters contaminated by heavy metals or other toxins. Large or long-lived, carnivorous finfish at the top of the food chain will contain more heavy metals than other fish that live in the same stretch of ocean. Large trout caught in the geothermal-rich waters of some Rotorua district lakes can also contain higher levels of mercury than is normal for this species.

There is a recommended maximum total mercury intake of 5.5 ug/kg per week. Average New Zealand intakes are lower than 24% of this recommendation. **There have been no reported cases of mercury poisoning in New Zealand or Australia as a result of seafood consumption.**

The New Zealand Food Safety Authority says that for most commonly eaten fish and seafood species in New Zealand there is little concern about mercury levels and these species can be eaten freely by pregnant women. The Total Diet Survey 2003/04 showed that mixed fish species (eg, battered fish and fish fingers) are also low in methylmercury and can be eaten without restriction.

Fish species to be mindful of during pregnancy include some of the longer lived and larger fish, and consumption of these types should be limited to three to four servings (each of about 150g) per week. These include albacore tuna, gemfish, orange roughy, ling, skate, kahawai, groper, bluenose, ghost sharks, oreo dories, red cod, ribaldo and rig (spotted dogfish or lemonfish).

There are a small number of species where it would be wise to eat no more than one serving per week or fortnight during pregnancy, and not at all if consuming other types of seafood. These include dogfish (apart from rig), school shark, swordfish, marlin, cardinal fish, and fish caught from waters in geothermal regions (volcanic origin sediments are relatively high in mercury). Pregnant women should also limit their intake of oysters and queen scallops due to high cadmium concentrations.²

Key		
\$	<\$10/kg	* <4% total fat/oil content
\$\$	\$10-20/kg	** 4-9% total fat/oil content
\$\$\$	\$20-30/kg	*** >9% total fat/oil content
\$\$\$\$	>\$35/kg	

Seafood type	Cost	Oiliness
mackerel: tinned	\$	***
kahawai	\$	**
pilchard	\$	**
cream fish/leatherjacket	\$	*
grey mullet	\$	*
mussel	\$	*
pipi/cockle	\$	*
red cod	\$	*
skate	\$	*
squid	\$	*
surimi	\$	*
tuna:tinned	\$	*
salmon (including tinned)	\$/\$\$/\$\$\$\$	***
warehou	\$\$	***
alfonsino	\$\$	**
tarakihi	\$\$	*
bluenose	\$\$	*
cardinal	\$\$	*
flounder	\$\$	*
gurnard	\$\$	*
hoki	\$\$	*
lemon fish	\$\$	*
ling	\$\$	*
rig/lemon fish	\$\$	*
sole	\$\$	*
trevally	\$\$	*
eel: conger/freshwater	\$\$/\$\$\$\$	***
tuna: fresh	\$\$/\$\$\$\$	***
crab	\$\$/\$\$\$\$	*
dories	\$\$/\$\$\$\$	*
scampi	\$\$/\$\$\$\$	*
turbot	\$\$/\$\$\$\$	*
butterfish	\$\$/\$\$\$\$	*
groper/hapuku	\$\$/\$\$\$\$	*
snapper	\$\$/\$\$\$\$	*
kingfish	\$\$\$	*
orange roughy	\$\$\$	*
shrimp/prawns	\$\$\$	*
swordfish	\$\$\$	*
blue cod	\$\$\$	*
kina roe	\$\$\$	*
oyster	\$\$\$/\$\$\$\$\$	*
scallop	\$\$\$/\$\$\$\$\$	*
crayfish	\$\$\$\$	*
paua/abalone	\$\$\$\$	*
whitebait	\$\$\$\$	*

Seafood's Health Benefits

Cooking and canning do not appear to harm either the quality or quantity of beneficial omega-3 rich oils in seafood.

Strong Evidence of Health Benefits:

HEART AND CIRCULATION

Primary Prevention

Studies indicate that one or two serves of finfish per week can substantially lower the risk of coronary heart disease. In one study, finfish consumers had less than half the mortality rate of people who ate no finfish.³ The highest rates of heart disease have been recorded for men who eat no finfish at all.

Secondary Prevention

People on a 'Mediterranean diet' (that included an average of 329 grams of finfish per day) had far lower heart attack and death rates in the five-year follow-up period than people on a low-fat diet. Two years into the study, the results were so striking that the trial was stopped; all participants were recommended to follow the Mediterranean diet.⁴

Blood Flow

Fish oils are thought to increase nitric oxide levels released by blood vessel tissue (especially when it has been injured) and to locally relax blood vessels.

Other research shows that omega-3-rich fish oil helps to dilate the coronary artery in heart transplant patients.

In patients with Type 2 diabetes mellitus, fish oil has been shown to improve blood flow in the forearm – indicating protection against blood vessel constriction and thrombosis.⁵

Blood Pressure

Early studies on the effect of consuming fish oil on high blood pressure showed significant lowering of blood pressure. Other studies have shown no – or relatively small – effects on blood pressure. A meta-analysis concluded a small but statistically significant effect of fish on lowering blood pressure.⁶



Arrhythmia

There is considerable evidence that the consumption of omega-3 fat enriched diets leads to a marked reduction in the susceptibility of the heart muscle to develop heart arrhythmia and subsequent sudden cardiac death.⁷

DIABETES

People with diabetes have an increased risk of developing heart and other cardiovascular diseases. Consequently, diabetes and heart disease management require a combined strategy.

Omega 3 seafood fats have a positive effect on risk factors for heart disease such as platelet aggregation, blood pressure and plasma lipoprotein metabolism.

In people with diabetes, caution needs to be exercised in supplementation with omega-3 fish oil capsules as dosages of 4–10 grams/day may result in increased levels of blood glucose.

This equates to about 3+ serves of seafood per day. Lower supplemented doses (2.5 grams/day) or eating 1 – 4 serves of seafood a week does not raise blood glucose levels, and have been shown to reduce the risk factors for heart disease.

Omega-3 fat intake can reduce insulin resistance in skeletal muscle by favourably altering the omega-6 to omega-3 ratio.⁸

RHEUMATOID ARTHRITIS

Increased consumption of finfish may improve symptoms of rheumatoid arthritis. This occurs by modification of the inflammatory pathway described earlier. Studies of fish oil consumption have shown beneficial reductions in joint swelling, morning stiffness and increased grip strength.⁹

Promising Preliminary Results:

PREGNANCY AND LACTATION

Increasing the intake of seafood during pregnancy and lactation will benefit both mother and child. The benefits are not only from the omega-3 oils, but also trace elements such as iron, iodine and selenium.

During pregnancy, the foetus requires omega-3 fatty acids and obtains them from the mother. The omega-3 fatty acid DHA is required for early development of nerve and brain cells in infants.

In general, DHA levels in the mother get progressively lower as the pregnancy becomes more advanced. It appears the mother's DHA source is not easily replenished in time for subsequent pregnancies and if the mother breastfeeds, this replenishment is likely to take longer.

DHA is found in breast milk and the levels in breast milk are predicted by how much seafood the mother eats. In one study, breast-feeding mothers achieved an average DHA level in breast milk of 0.46% by consuming 400 milligrams/day of DHA (equivalent to a serving of fresh salmon). A level of 1.13% was achieved by consuming 1300 mg DHA per day. A DHA level in breast milk of 0.21% or less may not be sufficient for optimal neural development in young infants.¹⁰

CROHN'S DISEASE

A study of Crohn's disease patients who consumed fish oil (2.7 grams/day of omega-3 fatty acids) showed significantly higher remission from symptoms. Using fish oils to treat Crohn's patients requires substantially more fish oil than can be obtained from eating finfish. Consequently, fish oil capsules are usually required.¹¹

ASTHMA

The suggested ratio of omega-6 to omega-3 is 2.5:1, but research has shown that the ratio in the typical Western diet is 17:1. It is thought that this imbalance between omega-6 and omega-3 fats encourages the immune system to overproduce cytokines, which in the airways make lung tissue over-sensitive to irritants such as dust and pollution. The omega-3 fats from fish oil, which reduce cytokine production, may help to reduce airway inflammation.¹² Further research is required to confirm, the benefits of omega-3 fats in asthma.



Seafood's Health Benefits

SKIN CONDITIONS

Emerging evidence links fish and omega-3 fats to improvement in atopic dermatitis (eczema) and psoriasis.

Ongoing Research– Watch This Space!

NEUROLOGICAL FUNCTION AND HEALTH

There is an association between seafood consumption and reduced incidence of depression.

A multi-national comparison of depression prevalence shows that Japan – where seafood consumption averages 67kg per year – has a relatively low prevalence of depression at 0.12%. New Zealand has an average seafood consumption of 18kg per person per year and a high prevalence of depression: 5.8%. Mood was also associated with fish consumption in 4500 New Zealanders and the area is being followed up by treatment trials.¹³

Research is also being carried out to investigate the role of seafood and omega-3 fats in dyslexia, attention deficit hyperactivity disorder (ADHD) and dementia.

Overall Health Benefits and Preventive Action:

TRACE ELEMENTS IN SEAFOOD

Selenium – New Zealand has particularly low selenium levels in its soil, so selenium from other sources such as seafood is very important.

The RDI for selenium is 85mcg for men and 70mcg for women, and fish provides approximately 30mcg per 100g – one of the best sources of selenium in New Zealand.

Iodine - New Zealand soils are also low in iodine. Until recently, the New Zealand diet contained sufficient levels of iodine, provided by the fortification of table salt and the use of iodophor compounds as sterilisers in the dairy industry. Recently however health messages have included the reduction of table salt intake, and the dairy industry no longer uses iodophors in sterilisation. This has resulted in a decrease in iodine consumption. New Zealand needs to explore alternative sources and fish provides a good source of iodine.

OBESITY

Finfish is a protein source that has low saturated fat content and can contribute to calorie-controlled weight loss diets, particularly when it replaces high-fat sources of protein.

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Tasty, Easy Seafood Meals

Bar-B-Que Mussels

- 2 dozen half shell mussels
- 2 tbsp honey
- 2 oranges (cut into segments – reserve the juice)
- 4 tbsp olive oil
- 1 tbsp chopped thyme

Thaw mussels (or steam 2 dozen fresh mussels and remove top shell)

Mix honey, orange juice, oil and thyme together and pour over mussels. Leave to marinate at least 10 minutes.

On a barbecue or in a heavy pan, cook mussels (shell side up) until golden brown.

Garnish with orange segments.

Serves 4



Fish Fillets with Tomato and Avocado

The very mild tasting fish is baked in healthy fruit topping.

- 175g/6oz fish fillets
- salt and freshly ground black pepper
- 650g/1.5lb tomatoes, peeled and sliced
- 2 tablespoons balsamic vinegar
- 1 tablespoon olive oil
- 2 avocado's, peeled and sliced
- 2 rounded tablespoons chopped basil

Lay the fillets in large, shallow, ovenproof dish and seasons well. Cover with the tomato slices, half the basil and pour over the vinegar and olive oil. Cover with foil and bake in a moderately hot oven, 200C° for 20 minutes.

Add the avocado slices, more seasoning, re-cover and cook for a further 10–15 minutes or until the fish is cooked through. Sprinkle with the remaining basil before serving hot or cold.

Serves 4



Fish Kebabs

New Zealand snapper is firm and meaty enough to barbecue or grill.

650g/1.5lb firm fish like snapper or ling

4 tablespoons olive oil

Grated rind and juice 1 lime

1 teaspoon coriander seeds, crushed

Salt and freshly ground black pepper

1 large courgette, thickly sliced

1 large red pepper de-seeded and cut in chunks.

Cut the snapper fillet into 2.5cm / 1 inch cubes and marinate with olive oil, lime rind and juice, coriander seeds and seasoning, for 45 minutes to 1 hour but no longer or the acid of the lime will break down the texture of the fish.

Thread the cubes of fish on to four skewers alternating with courgettes and peppers. Grill or barbecue for about 8 minutes, turning once and basting with the marinade, until the fish is just cooked and lightly browned. Serve on a bed of spiced rice.

Serves 4



For more seafood recipes visit
www.greatestmeal.co.nz



The New Zealand Seafood Industry Council Ltd

Kahawai Baked in Foil

4 large squares of tin foil

12 black olives (halved)

1 whole 1kg kahawai

Cracked pepper, sea salt

1 lemon (cut into 12 slices)

2 capsicums (1 green, 1 red)

4 spring onions

1 cup olive oil

1 celery stalk (finely sliced)

100g butter

4 whole chillies (fresh)

1 garlic clove (crushed)

1 large onion (sliced)

Fillet the kahawai, keeping the skin and removing the bones – cut each in half.

In a heavy hot pan put 3 tbsp of olive oil and when hot cook the kahawai, skin side down for 1 minute, then remove.

On to each square of foil place first the sliced onion and garlic, then the kahawai – everything else goes on top – finishing with the lemon slices, 25g of butter and splashes of oil.

Make into an enclosed parcel and bake for 25 minutes at 230C°.

Serve the foil parcel directly on to the plate and leave open to enjoy the steam and aromas.

Serves 4



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