

Omega 3 Fatty Acids by Simon Heather

We need a ratio of 1:1 of Omega 6 fatty acids and Omega 3 fatty acids in our diet. However most people have a ratio of 20:1 Omega 6:Omega 3 because of the use of certain vegetable oils in processed foods.

The ratio of Omega 6:Omega 3 in the following oils is: sesame oil 138:1, corn oil 46:1, sunflower oil 19:1, soyabean oil 7:1, walnut oil 5:1, canola oil 2:1, olive oil 13:1, flax oil 1:3, peanut oil has no Omega 3.

The ratio of Omega 6:Omega 3 in the following nuts and seeds is: almonds 1987:1, brazil nuts 1150:1, pumpkins seeds 114:1, pistachio nuts 52:1, pecans 21:1, English walnuts 4:1.

It is estimated that 85% of people in Western countries are deficient in Omega 3 and are getting far too much Omega 6 in their diet. Surveys show that nine out of ten Britons don't get the minimum amount of Omega 3 they need to maintain a healthy heart (around 500mg/day), let alone to support optimal brain and immune system functioning (1000mg/day).

Omega 3 can be found in flaxseed oil, walnut oil, canola oil, hemp seeds, chia seeds, kiwifruit, butternut and in oily fish such as anchovies, herring, mackerel, salmon, sardines and tuna. Kelp is also a source of Omega 3.

Wheat

Before 1870 there was only stone ground wheat. By 1880 all grindstones throughout Europe and America had been replaced with iron, steel, or porcelain rollers.

Before the industrialised roller-milling revolution, it was difficult to produce white flour. Stone grinding removed the bran from the wheat kernel and therefore most of the fibre, but it didn't remove the germ, which contains oils that are rich in nutrients. The stone mills simply crushed the germ and released the oil. This tinted the flour a yellow grey colour (the yellow is carotene) which shortened the flour's shelf life once it was exposed to the air.

The flour soon oxidised and turned rancid. It didn't look or smell good after it had turned rancid. What people didn't realise was that the nutrients were in the wheat germ. Wheat germ oil contains nutrients such as protein, folic acid, B vitamins, carotenes and other antioxidants, such as Omega-3 fatty acids. It was probably the Omega-3 in the flour that caused it to go rancid.

With roller milling came the ability to remove the wheat germ as well as the fibre, leaving behind starch and a little protein. Everyone could now afford white flour that would last for many months. The problem with this new white flour was that it was nutritionally worthless. As well as wheat, corn and rice flours suffered from the same fate.

Wherever these refined flours appeared so did epidemics of pellagra (caused by vitamin B3 deficiency) and beriberi (caused by vitamin B1 deficiency). In the 1930's

vitamins were discovered and scientists soon found out why everyone was sick. By 1941 Governments made it a law that B vitamins had to be added to the white flour.

Health Benefits

Dr Alex Richardson works for the charity Food & Behaviour Research and is one of the world's leading researchers into Omega 3. She believes that consuming more of the Omega 3 fatty acids found in fish is probably the single most important dietary change that most people could make to improve their health.

She says, "It is well-known that Omega 3s are important for staving off heart attacks and strokes, and are good for eyesight and inflammatory conditions such as arthritis. But it's less well known that EPA and DHA are crucial for brain function and mental well being. EPA (eicosapentaenoic acid) and DHA (docosahexaenoic acid) are the most important forms of Omega 3".

Scientific studies have shown that consuming 3g or more of fish-oil Omega 3 fatty acids every day reduces pain and inflammation in rheumatoid arthritis. Other studies have shown that eating oily fish helps in the treatment of diabetes and ulcerative colitis. There are also studies that suggest eating fish-oil may help to ward off Alzheimer's disease.

Eating fish oils have been used to treat bipolar disorder and have been shown to reduce memory loss and improve cognitive function.

Children who eat oily fish four times a week have a lower risk of developing asthma. Researchers found that eating 3.3 grams of oily fish a day markedly helps breathing difficulties. Women of child bearing age and children should limit their consumption of fish such as tuna that may be high in mercury to 12 ounces a week.

Current dietary guidelines recommend eating two portions of fish a week, one of which should be oily, because it has been observed in many studies that people who do this are less likely to die from a heart attack. Researchers at Harvard University found that eating 2 grams of Omega 3 fatty acids from fish reduces our risk of dying from heart disease by 36%.

The best way to get nutrients is from food. When you eat oily fish, you are eating a cocktail of nutrients such as zinc (involved with wound healing and cell division) and vitamin B12 (essential for blood cell production).

Oily fish also contains vitamin D and amino acids, which may work together with the Omega 3 fatty acids to reduce the risk of stroke. This suggests that we may need all the constituents of a food for it to be good for you.

The mechanism by which fish oil is meant to reduce strokes and heart attacks is unclear, but Omega 3 fatty acids are thought to reduce triglyceride fats, inflammation and blood clotting.

Salmon

Salmon is very high in Omega 3 fatty acids. Just one six-ounce serving of tinned wild salmon each week provides a week's worth of Omega 3. Wild Alaskan Salmon has the

highest Omega 3 content of all fish. Anchovies and mackerel are also high in Omega 3 and are low in mercury. Tinned salmon generally has low levels of mercury in it compared to tinned tuna.

If you tip away the juice from a can of tinned salmon may be tipping away most of the Omega 3 fatty acids. Smoked salmon contains a lot of sodium so avoid it if you have high blood pressure.

Farmed salmon contains less Omega 3 fatty acids than wild salmon. Farmed salmon contain a higher percentage of PCB's in their fat than wild salmon. Fish farms put antibiotics in the water to reduce the incidence of disease and infections amongst the closely packed fish (for information on PCB's go to page 6).

It takes five pounds of commercially caught fish (mainly anchovies) to create one pound of farmed fish. Farmed salmon has twice the fat of wild salmon, and this fat collects toxins. Buy wild salmon or organically farmed salmon. Not only is this better for your health but it is also better for the environment.

Tuna

Tuna in spring water or brine may give you more Omega 3 than tuna in oil, if you drain the oil from a can of tinned tuna most of the Omega 3 goes down the drain!

Premium brands of tinned tuna are hook and line caught and are not highly processed. The smaller companies pack the tuna into the can raw and only cook it once. The bigger commercial fisheries debone their tuna and add additives to it before they can their fish. The bigger commercial fisheries cook their fish twice, which results in the loss of most of the Omega 3.

Six ounces of tinned Gourmet Albacore Tuna in olive oil not drained will give you 8.1 grams of Omega 3 compared to only 0.34 grams of Omega 3 from the same amount of light tuna canned in oil.

Fish Oil Supplements

Dr Richardson says that the poor quality of many supplements is a concern. 'There are different kinds of Omega 3 - not all of which have the same health benefits,' she says. One of the main problems, she explains, is that some supplements often contain little, if any, EPA (eicosapentaenoic acid) and DHA (docosahexaenoic acid) - the most important forms of Omega 3.

Recent scientific research has found that taking fish oil supplements can reduce the risk of angina, heart attack, depression, and colon cancer. Taking fish oil supplements of 2 grams a day can lower blood pressure in people with high blood pressure.

Cod liver oil and fish oils are not the same. Fish oils are extracted from the flesh of the oily fish like salmon or herring. Cod liver oil is a good source of Omega 3 but has too much vitamin A and D compared to fish oil supplements.

Make sure that the fish oil in the supplements you buy is sourced from non polluted waters and the fish are sustainably caught. The fish oil supplement should contain

EPA and DHA (the most important forms of Omega 3) plus other components such as carotenoids and tocopherols (vitamin E). The fish oils need to be tested for PCBs and other pollutants.

What is the Difference between Flaxseed Oil and Omega 3 Fish Oil?

The two leading sources of Omega-3 fatty acids are fish oil and flaxseed oil. Flaxseed oil is rich in the Omega 3 fatty acid ALA (alpha-linoleic acid) while fish oil is rich in two other Omega 3 fatty acids, EPA and DHA. EPA and DHA can be synthesised from ALA, but may not be synthesised to adequate levels.

Omega 3 fatty acids are essential for the production of signalling molecules, especially pro- and anti-inflammatory eicosanoids. Under-consumption of Omega 3 fatty acids and over-consumption of Omega 6 fatty acids, very common in the modern diet, may lead to chronic, low-grade inflammation.

Omega 3 fatty acids are also used to synthesise essential components of cellular membranes, especially in the brain, blood vessels and heart. Indeed 8% of our brain is made up of EPA and DHA. Lack of Omega 3 fatty acids in these membranes disrupts the normal signalling of these tissues raising the risk of heart disease and neuropsychiatric disorders such as depression, anxiety and bipolar disorder.

ALA can only be found in flaxseeds. Flaxseeds contain 55% ALA. Eating flaxseeds may help in the management of inflammation and cholesterol levels. The ALA which flaxseed oil supplies is good for the heart and that is good news for possible prevention of heart attacks.

Consumption of flaxseed oil is not always adequate to supply all the DHA and EPA the body requires. Most humans cannot efficiently convert ALA, a short-chain Omega 3 found in plants to the potent longer-chain Omega 3 EPA and DHA found in fish oil. Humans produce only a limited amount of the enzyme delta-6 desaturase, which aids in that conversion.

Healthy young women can typically convert 30% of ALA to EPA and DHA whereas men may only convert 5-12% of ALA to DHA and EPA. It appears beneficial, especially for men, to consume fish oil to get the required DHA and EPA.

EPA is used by the body to create a number of hormone like substances that reduce inflammation and blood pressure.

It is important that our bodies get all three fatty acids: ALA, EPA and DHA. Decreases in the blood levels of Omega 3 has been associated with an increased risk of arthritis, heart disease, type 2 diabetes, cancer, skin disorders, osteoporosis and mood disturbances.

A 15 ml, or 1 tablespoon, portion of flaxseed oil contains 7 gram of ALA. For those using flaxseed oil as a substitute for fish oil, 7.2 gram of flaxseed oil is approximately equivalent to 1 g of fish oil in terms of production of EPA and DHA.

Food companies are increasingly fortifying their food and beverage products with Omega 3. Some use Omega 3 from fish oil or algae oil, which contain the beneficial

EPA and DHA. However, some food companies fortifying their products with ALA from flax oil in order to put "contains Omega 3" on the package.

It is more expensive to fortify products with fish oil, and making great tasting foods with fish oil can have its challenges. Many times the front of the package will only say "contains Omega 3" and it may not be obvious whether the source is oil from fish, flax or algae. Be sure to read the label of fortified foods to know the source of the Omega 3. Look for flax or flaxseed in the ingredient statement and you'll know the product contains ALA.

Dr Richardson says that vegetarian Omega 3 supplements are made with flax oil that comes from linseed and provide a different form of Omega 3. Vegetarians would be better off taking supplements containing DHA from algae.

When choosing a fish oil supplement ignore any doses suggested on the packet, and focus on the small print to find out how much EPA and DHA the product provides. A good target for mental well being and performance is 1000mg per day, she says. And to get this amount, you may well need to take more than the manufacturer's suggested dose.

Don't buy the more expensive combination supplements containing Omega 3, 6 and 9. Our bodies produce Omega 9 and it is also found in nuts, seeds, avocados and olive oil. Omega 6 is found in vegetable oils, meat, eggs and dairy products.

We should be trying to reduce our Omega 6 consumption rather than boost it. A diet low in Omega 3 and high in Omega 6 is linked to a range of conditions, including heart disease, depression, allergies and cancer.

Types of Fish Oil Supplements

There are three types of fish oils. The first are the most expensive: 'ultra-refined' oils, which have the lowest possible levels of pollutants such as mercury and lead. The oil is also highly concentrated, and the refining process removes the compounds responsible for the 'fishy' taste and gastric discomfort some pills can cause.

The next type of fish oils are 'concentrates'. These don't provide as much EPA and DHA per gram as the ultra-refined oils, but they do give you more than basic oils. Some fishy taste may remain as well as some level of pollutants.

The basic fish oil supplements provide very little EPA and DHA and most probably contain pollutants.

Dr Richardson found that the very best fish oil supplements are the ultra-refined oils, such as Omega Swirl. Although these usually cost more, these oils are much better value for money than the cheaper pills and they come from non-polluted sources.

The Health Food Manufacturers' Association said: 'Although no formal RDA (recommended daily allowance) exists, an intake of between 500 and 600 mg per day EPA plus DHA would be the typical recommendation and it is true that some supplements provide less than this amount.'

You can take fish oil supplements over long periods of time. Taking fish oil supplements does reduce blood concentration of vitamin E. The better quality fish oil supplements will include vitamin E (tocopherols).

Omega 3 supplements may change the dosage needed for certain medications or may interfere with the absorption of medications taken at the same time. Always check with your doctor before beginning supplementation. Anyone taking blood-thinning medications should consult their doctor before taking fish oils.

Recommended Fish Oil Supplements

Barlean's Omega Swirl Lemon Zest Fish Oil - £15.99 for 473 ml

Minami Nutrition MorEPA Smartfats Deep Sea Fish Oil - £19.50 for 60 capsules

BioCare Mega EPA Fish Oil Concentrate - £7.65 for 30 capsules

Higher Nature Omega 3 Fish Oil - £8.10 for 90 capsules

Boots Brain and Heart High Strength Omega Fish Oil - £6.99 for 30 capsules

Comparison

Barlean's - 365mg EPA/DHA a teaspoon

Minami Nutrition - 663mg EPA/DHA per capsule

Boots - 550mg EPA/DHA per capsule

BioCare - 520mg EPA/DHA per capsule

Higher Nature - 275mg EPA/DHA per capsule

Apart from Boots all these companies guarantee that their fish oils are screened for PCBs and other pollutants (see below) I am not sure about the other brands. I keep BioCare Fish Oils in stock for my clients.

What are PCBs?

Polychlorinated biphenyls (PCBs) are a group of manufactured organic chemicals that contain 209 individual chlorinated chemicals (known as congeners). Concentrated PCBs are either oily liquids or solids and are colourless to light yellow in colour. They have no known smell or taste. There are no known natural sources of PCBs.

PCBs don't burn easily and are good insulating material. They have been used widely as coolants and lubricants in transformers, capacitors, and other electrical equipment. The manufacture of PCBs stopped in the United States in 1977 because of evidence that they build up in the environment and cause harmful health effects. Products containing PCBs include - fluorescent lighting fixtures, electrical appliances containing PCB capacitors, old microscope oil, and hydraulic fluids.

During the time that PCBs were manufactured, there were often no effective controls on disposal. Because they do not break down easily, PCBs are now found widely distributed in our environment. Generally their concentrations in the environment are quite low. However, the chemical properties of PCBs cause them to be concentrate up the food chain.

Fish can concentrate extremely high levels of chemical residues in their flesh and fat. As big fish eat little fish, PCBs become more concentrated in their flesh. Fish-eaters who ingest these dangerous chemicals suffer from increased cancer risk and may experience decreased mental functioning and damaged sexual health.

PCBs are dangerous because they act like hormones, wreaking havoc on the nervous system and contributing to a variety of illnesses, including cancer, infertility, and other sexual problems.

Researchers at the University of Illinois found that fish-eaters with high levels of PCBs in their blood have difficulty recalling information that they learned just 30 minutes earlier.

Inuit people, whose diets consist largely of fish, have been found with PCB levels of 15.7 parts per million in their fat, far higher concentrations than the maximum amount considered to be safe in fish by the EPA (.094 p.p.m.). Nearly all Inuit have PCB levels far above guideline levels that health officials consider safe, and some Inuit have ingested so much contamination from fish that their breast milk and body tissues would be classified as hazardous waste.

References

Is your Omega-3 fish oil supplement any good - or a load of old codswallop? by Caroline Ballinger - Daily Mail 20th November 2008

What is the Difference between Flaxseed Oil and Omega 3 Fish Oil?

<http://www.livestrong.com/article/390622-what-is-the-difference-between-flaxseed-oil-omega-3-fish-oil/#ixzz2JOQgHer5>

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