

ESSENTIAL FATTY ACIDS

The human body is a fantastic biochemical factory which is able to make complex molecules from humble beginnings. Essential Fatty Acids (EFAs), however, are necessary fats that cannot be made by the body, and therefore must be obtained from your diet.

EFAs perform myriad functions:

- They support the cardiovascular, immune, nervous and reproductive systems.
- They manufacture and repair cell membranes, enabling the cells to obtain optimum nutrition and expel harmful waste products.
- They produce prostaglandins - hormone-like substances which regulate heart rate, blood pressure, blood clotting, muscle contraction, fertility, and conception. Prostaglandins also modulate inflammation and encourage the body to fight infection, thereby supporting immune function.
- They ensure proper growth in children, particularly development of the nervous and sensory systems. Foetuses and breast-fed infants also require an adequate supply of EFAs which is obtained through the mother's dietary intake.

There are 2 families of EFAs:

1. Omega-3 - Linolenic acid
2. Omega-6 - Linoleic acid

Omega-3

The important omega-3 fatty acids in human nutrition are: alpha-linolenic acid (ALA), eicosapentaenoic acid (EPA), and docosahexaenoic acid (DHA). Of note, ALA is the principal omega-3 fatty acid and a healthy person will convert this into EPA, and later into DHA.

Omega-3 deficiencies are associated with:

- Growth retardation in infants, children, and pregnant women
- High blood pressure
- Impaired cell membrane function
- Increased tendency to form blood clots
- Increased triglycerides and 'bad' cholesterol (LDL) levels
- Irregular heart beat
- Learning disorders
- Menopausal discomfort
- Poor memory and concentration
- Poor vision
- Reduced immune function
- Tingling sensations in arms and legs

Omega-3 Food Sources



- Avocados
 - Brazil nuts
 - Canola oil (cold-pressed & unrefined)
 - Cheese from grass-fed cows (organic)
 - DHA-enriched eggs
 - Flaxseeds & flaxseed oil
 - Hempseeds and hempseed oil
 - Milk from grass-fed cows (organic)
 - Oily fish (salmon, mackerel, fresh tuna)
 - Pumpkin seeds
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- Sesame seeds
 - Some dark leafy green vegetables (e.g. kale, spinach)
 - Soybean oil
 - Walnuts
 - Wheat germ oil

Whilst beneficial, it is important to note that plant sources of omega-3 do not contain EPA or DHA. Hence the general consensus that essential fatty acids from animal sources (e.g. cold-water oily fish) are better utilised by the body.

Omega-6

Linoleic acid is the primary omega-6 fatty acid. A healthy person with good nutrition will convert linoleic acid into gamma-linolenic acid (GLA). This, along with EPA from the omega-3 group, will later be synthesised into eicosanoids. The latter assist many bodily functions including vital organ function and intracellular activity.

Omega-6 deficiencies are associated with:

- Arthritis-like conditions
- Behavioural changes
- Dry skin and hair
- Dry, itchy eyes
- Eczema-like skin eruptions
- Growth retardation
- Hair loss
- Heartbeat abnormalities
- Poor wound healing
- Pre-menstrual syndrome
- Susceptibility to infection

Omega-6 Food Sources



- Blackcurrant seed oil
- Borage oil
- Chestnut oil
- Chicken
- Evening primrose oil
- Flaxseeds & flaxseed oil
- Grapeseed oil
- Hempseeds and hempseed oil
- Olives and olive oil
- Pine nuts
- Pistachio nuts
- Pumpkin and sunflower seeds

Ensure that all oils are cold-pressed and unrefined.

Of note, corn, safflower, sunflower, soybean, and cottonseed oils are also sources of linoleic acid (omega-6), but these are usually refined and may be nutrient-deficient as sold in shops.

The Importance of Balance

When it comes to omega-3 and omega-6, balance is fundamental. The ideal ratio of omega-6 to omega-3 fatty acids is between 1:1 and 4:1. Typical Western diets, however, provide ratios of between 10:1 and 30:1, therefore dramatically skewed towards omega-6.

EFA deficiency and omega 6/3 imbalance are linked to serious health conditions, including:

- Accelerated ageing
- Attention deficit hyperactivity disorder (ADHD)
- Alzheimer's disease
- Arthritis
- Asthma
- Cancer
- Depression
- Diabetes
- Heart attack & stroke
- Insulin resistance
- Lupus
- Obesity
- Schizophrenia

... among others.

Although most Westerners obtain an excess of linoleic acid (omega-6), it is often not converted to GLA due to metabolic problems caused by diets high in alcohol, sugar, or *trans* fats in processed foods. Smoking, pollution, stress, ageing, viral infections, and illnesses such as diabetes, can also impede this conversion. Where possible, these issues should be addressed to ensure optimum functioning of the body.

A health dietary intake of both linolenic (omega-3) and linoleic (omega-6) acid, per adult per day, is approximately 1.5 grams of each. One tablespoon of flaxseed oil can provide this amount. Current research, however, indicates that the 'time-released' effect of consuming varied omega-3 foods is more beneficial than a once-daily intake of oil. My advice, therefore, would be to take one tablespoon of flaxseed oil daily *in addition to* avocados, handfuls of mixed nuts and seeds, DHA-enriched eggs and at least 2-3 portions of oily fish per week. Refer to the 'Food Sources' sections for additional EFA-rich foods.

EFAs in the Kitchen

- Heat, light and oxygen destroy EFAs; avoiding cooked or heated forms of these foods is therefore advisable. Raw nuts, for example, are a better source of EFAs than the roasted variety. Also, flaxseed oil should never be used for cooking - extra-virgin olive oil is more able to withstand high temperatures and therefore a better choice.
- Add flaxseed and/or extra-virgin olive oil to salads with a squeeze of lemon instead of supermarket salad dressings.
- Replace fatty snacks with mixed nuts and seeds.
- Use mashed avocados as an alternative to butter, margarine and mayonnaise in sandwiches.
- Cut back on red meat and replace with lean chicken and at least 2-3 portions of oily fish per week. Opt for wild and organic where possible.
- Look out for DHA-enriched eggs in your local supermarket. Two of these have the same EFA content as a portion of oily fish.
- Note that flaxseed oil - and all oils, should be stored in a refrigerator to preserve its nutrient content. Additionally, it should be purchased from a supplier who refrigerates the liquid.