

Oil4Life Test

New blood test that shows your protection against lifestyle diseases and gives guidelines on how to adjust your diet

by

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Summary

The World Health Organisation (WHO) predicts that by 2020, 70 % of all illness will be caused by poor diet and lifestyle. This includes cardiovascular disease, muscular and skeletal problems, milder psychological disorders and stress-related problems. Many of these problems, say the WHO, can be counteracted and prevented via lifestyle and dietary changes; and the fats and oils we eat are an important part of this.

People need Omega-3 and Omega-6 fatty acids in their diet to be able to live. These vital fatty acids compete to occupy the same places in the cell membranes, the smallest living units in the body. Your diet determines whether Omega-3 or Omega-6 wins the battle, a battle that is crucial to the body's capacity to repair injuries and resist disease.

The Oil4Life Blood test measures the Omega-3/-6 balance, and more. It was developed by the University of Milan, Italy, St. Olav's Hospital, Trondheim University Hospital, Norway and the Norwegian company Itogha AS. Tests are analysed at St. Olav's Hospital. The Oil4Life Test measures the profile of 11 fatty acids in the blood including saturated, Omega-9, Omega-6 and Omega-3 fatty acids, and calculates 3 different risk factors for lifestyle diseases: Fatty acid balance, Omega-3 level and Omega-6 share (% Omega-6 of the total long chain polyunsaturated fatty acids in the blood). The risk factors are calibrated against major international research studies and are used to calculate the degree to which individual persons are protected against lifestyle diseases. The fatty acid profile is also used to calculate the level of saturated fat, monounsaturated fat, polyunsaturated vegetable oils and polyunsaturated fish oils in the blood. This forms the basis for targeted guidance on dietary adjustment for individual users.

The report is based on 2218 analysed Oil4Life Test samples in the Nordic Countries, run in parallel with an Italian study with 1432 participants. Both these studies show that the body's protection against the development of lifestyle diseases profile and risk factors is extremely low in the youngest age groups (under 40), and that the risk can be reduced by adjusting the balance between Omega-3 and Omega-6 fatty acids in the diet. The fatty acid and risk factor scores provide a good basis for adjusting the diet with the aim of providing greater protection against the development of lifestyle diseases.

Background

About 30% of the normal diet consists of fats and oils. These contain many different fatty acids, but some are more important than others. The polyunsaturated Omega-3 and Omega-6 fatty acids are essential for life, and must be obtained in the diet. Main sources of these fatty acids are the vegetable oils (Omega-6) and fish oils (Omega-3). The diet also contains saturated fats, and monounsaturated fatty acids. After a meal, dietary fats and oils pass through the stomach to the small intestine where they are mixed with bile acid and enzymes and converted into fatty acids (Figure 1).

The free fatty acids are taken up by intestinal cells and liver cells that use the fatty acids as building blocks to produce triglycerides and phospholipids.

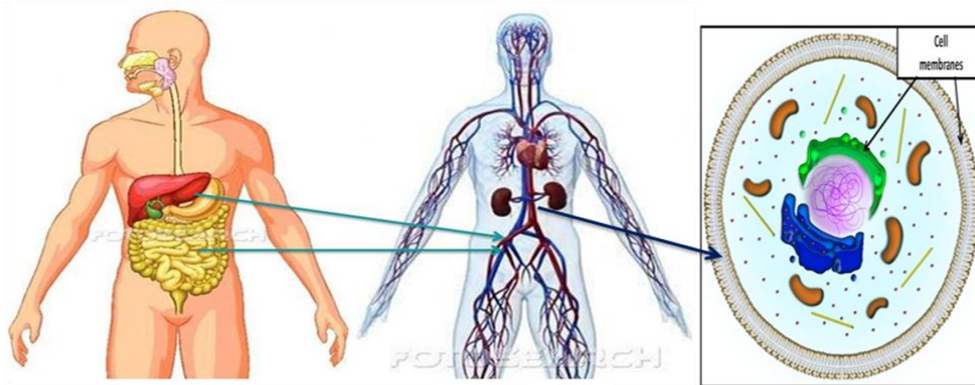


Figure 1. Dietary fatty acids are absorbed from the small intestine, and carried in the blood stream and lymphatics to all of the body's cells.

The fatty acids are bundled along with cholesterol and protein into various “boats” (VLDL, LDL, HDL, chylomicrons) that carry the fatty acids in the body's circulatory systems to all of the body's cells. Dietary cholesterol is carried to the cells principally by the “LDL” boat (Figure 2), while surplus cholesterol is carried back to the liver in the “HDL” boat and transformed into bile acid.

Triglycerides travel mainly on the “VLDL” and “chylomicron” boats, while phospholipids position themselves “on deck” in the different boats. Proteins in the boats recognise the docking points (receptors) in the cells that use Omega-3 and Omega-6 fatty acids as building blocks in the membranes surrounding the cell (Figure 1), enabling the “boats” to deliver the fatty acids to where they are needed.

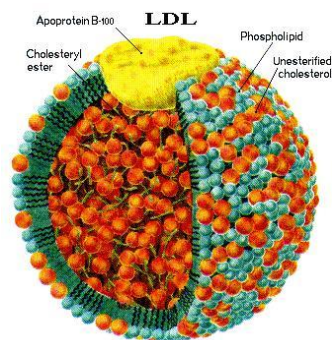


Figure 2. LDL cholesterol carries fatty acids in the blood to all of the body's cells.

Omega-3 and Omega-6 fatty acids compete for the same places in the membranes of your body's cells. Your diet determines whether Omega-3 or Omega-6 wins the battle, a battle that is crucial to the body's capacity to repair injuries and resist disease. The fatty acids on the “boats” in the blood stream represent the quality of the fat in your diet. The balance between Omega-6 and Omega-3 in your body (the Fatty acid balance) reflects the distribution between vegetable and fish fatty acids in your diet. Nordic health authorities recommend that the Omega-6/Omega-3 balance in your diet should be below 5:1, i.e. the intake of vegetable fats should not exceed 5 times the intake of fish oils. In May 2010, 2218 people were analysed using the blood test. The right-hand column of the table (Figure 3), which is part of the test report (Your blood values, %), indicates measured values for the

11 most important fatty acids in the blood for an arbitrary person. The column to the left of the measured values, "Model person, blood values, %" shows the average values for the same 11 fatty acids calculated on the basis of the values for 295 individuals who have optimal (> 75 %) protection against lifestyle diseases.

Fatty acids	Chemical name	Type of fat	*Model person blood values %	Your blood values %
Palmitic acid (PA)	C16:0	saturated	21.2	22.2
Stearic acid (SA)	C18:0	saturated	12.7	12.8
Oleic acid (OA)	C18:1	omega-9	22.9	23.5
Linoleic acid (LA)	C18:2	omega-6	22.2	23.1
Alfa-Linoleic acid (ALA)	C18:3	omega-3	0.5	0.5
GammaLinoleic acid (GLA)	C18:3	omega-6	0.5	0.7
dihomoGamma Linoleic acid(DHGLA)	C20:3	omega-6	0.9	1.1
Arachidonic acid (AA)	C20:4	omega-6	8.6	10.4
Eicosapentaenoic acid (EPA)	C20:5	omega-3	3.6	1.1
Docosapentaenoic acid (DPA)	C22:5	omega-3	1.8	1.2
Docosahexaenoic acid (DHA)	C22:6	omega-3	5.0	3.4
* Calculated as the mean value of all people measured with Your Protection over 75 % (n = 295)				

Figure 3. The Oil4Life Test measures blood levels of the 11 most important fatty acids in your diet, including Omega-3, Omega-6, Omega-9 and saturated fatty acids as a % of the total quantity of fatty acids. In addition to your blood values, it also gives the values for a model person, calculated as the mean value of people with "Your protection higher than 75 %".

On the basis of the 11 fatty acids measured, we calculate the distribution between saturated fat, monounsaturated oils, polyunsaturated vegetable oils and polyunsaturated fish oils in the blood. As indicated in Figure 4, these fat/oil groups have different sources in your diet. Comparing "your values" with blood values for our "model person" enables targeted changes to be made to your diet. Fat groups in the diagram (Figure 4) which the measured person should consume less of have a positive value (points upwards), while fat groups which the measured person should eat more of, have a negative value (points downwards).

The table (Figure 4) shows which fat groups are dominant in which foods. Using this table will help you to improve your diet. Admittedly, many folk find it hard to completely change their diet. It is usually easier to take the Oil4Life Balance; this generates a rapid improvement in blood values after 16 weeks, as shown in this study. Improved blood values should be maintained at the new level indefinitely; if you return to a normal diet, blood values deteriorate over a few weeks and go back to

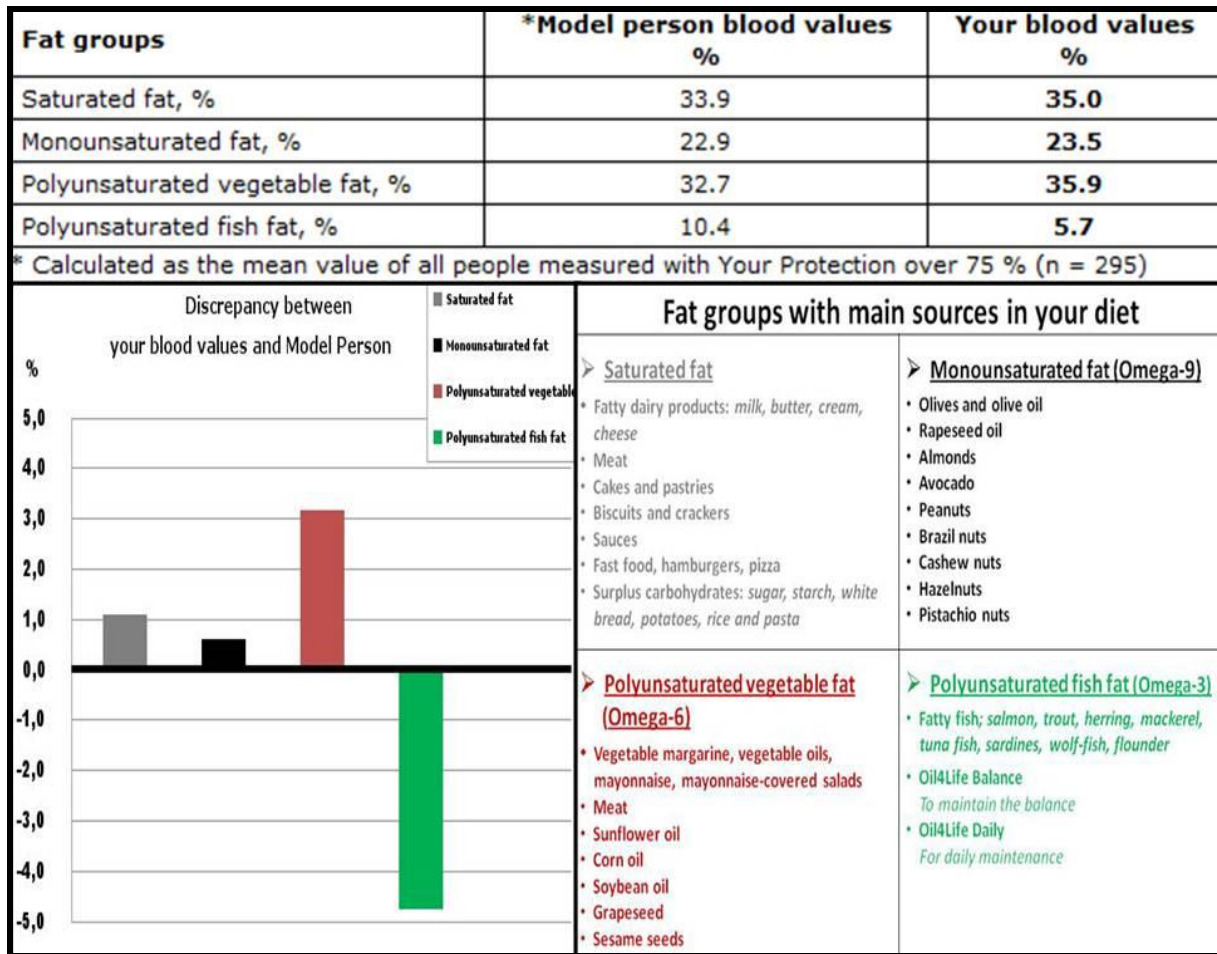


Figure 4. Fat groups which you should consume less of have a positive value (points upwards) in the diagram while fat groups you should eat more of have a negative value (points downwards). The table at the right of the diagram shows which fat groups are dominant in which foods. Using this table, you can enhance your diet quickly and appropriately.

where they were previously. When this happens, the health benefits of an improved Omega-3/-6 ratio are lost.

The health benefits of regulating the risk factors through targeted dietary adjustment and adjustment of the balance between Omega-3 and Omega-6 in the body are both immediate and long-term. Perceptible changes first occur in cells in the immune system that have a "lifetime" of 2-9 days before they are renewed; then in skin cells that have a "lifetime" of 14 days; and eventually in red blood cells that have a "lifetime" of 120 days. Italian studies show that stability is achieved after around 16 weeks.

Immediate benefits include a better capacity to resist disease, faster repair of injuries, strengthening of mental health and curbing of excessive inflammatory activity by immune cells - very important to people who are susceptible to cardiovascular disease. The major long-term benefit is a significant increase in the protection against the development of lifestyle diseases. International studies show that an Omega-3 level greater than 8 % of the fatty acids in the blood provides more than 90 % protection against cardiovascular disease, while an Omega-3 level of less than 4 % provides no protection. Results from more than 2000 Oil4Life Test samples calibrated against international studies show that a Fatty acid balance of less than 3:1 gives greater than 90 % protection against

lifestyle diseases, while a fatty acid balance of more than 9:1 provides no protection. An Omega-6 share below 45 offers greater than 90 % protection while values above 65 provide no protection. Figure 5 shows average values for different age groups in the Nordic countries. International research (Simopoulos, 2008) shows that when the balance between Omega-6 and Omega-3 drops below 5:1, this reduces the risk of developing various lifestyle diseases (Figure 6).

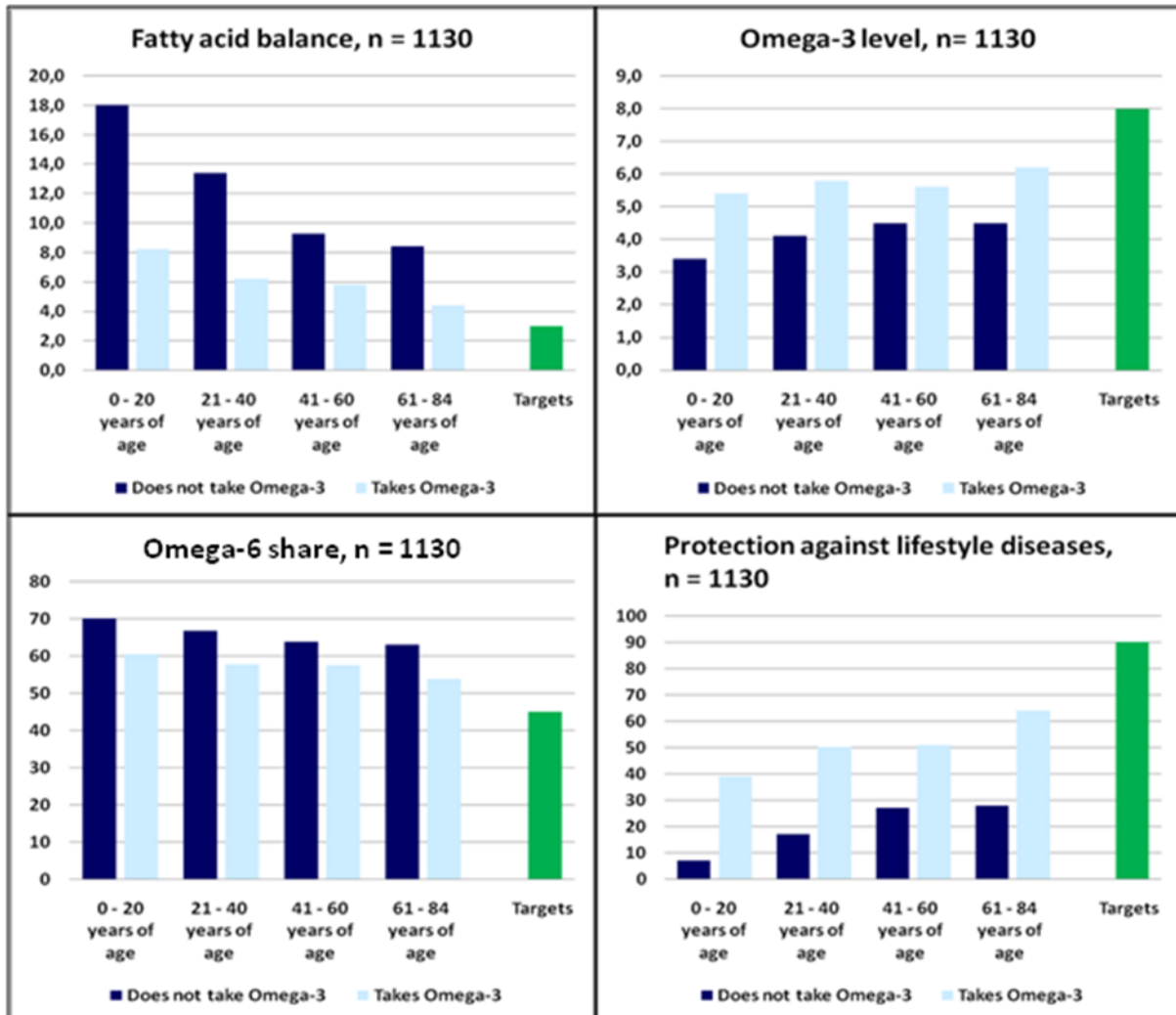


Figure 5. Average Fatty acid balance, Omega-3 level, Omega-6 share and Protection against lifestyle diseases for Nordic people in different age groups who took (n=714) or did not take (n=416) a daily Omega-3 supplement.

The recommended method for adjusting the fatty acid balance and other risk factors

To improve health prospects, it is essential to have a balanced ratio of Omega-3 and -6 fatty acids in the body. But apart from dietary imbalance, there is another problem. We are very prone to oxidation - a process which is the biological equivalent of rusting. Oxidation produces free radicals that destroy Omega-3 and Omega-6 fatty acids in cell membranes, reducing the body's capacity to repair injuries efficiently. All cells produce free radicals and reactive oxygen that can oxidise the Omega-3 and Omega-6 fatty acids. The body has therefore developed various antioxidant defences, including enzymes and a range of antioxidants. However, oxidative stress can arise when there is an imbalance between levels of oxidation in the body and the body's antioxidant defences. This occurs during extreme physical activity (such as during sport and athletics), and it also occurs when the diet is imbalanced. Conversely, the imbalances that create oxidative stress can be corrected by means of

Subject	omega-6 / omega-3	Comment
When humans were developed	1:1	Establishment of genetic pattern
Today's western diet	15-17:1	Plant oils and meat are preferred to fish
Cardiovascular disease	4:1	70 % reduction in total mortality
Colorectal and breast cancer	2,5:1	Reduced risk of developing cancer
Inflammatory diseases	2-3:1	Reduced inflammation with arthritis
Autoimmune diseases	5:1	Favorable effect against asthma

Figure 6. If the balance between Omega-6 and Omega-3 is less than 5:1 in the blood, this reduces the risk of developing various lifestyle diseases.

**Artemis P. Simopoulos, 2008. Mini review – The importance of the Omega-6/Omega-3 Fatty Acid Ratio in Cardiovascular Disease and Other Chronic Diseases. Society for Experimental Biology and Medicine, 674 - 688. The Center for Genetics, Nutrition and health, Washington, DC 2009*

dietary improvement. Optimal antioxidant and anti-inflammatory protection requires an intake of 8-9 portions of fruit and vegetables every day. Most people in Northern Europe consume less than half of this, which is why many people – and especially active people - suffer from excessive oxidative stress.

The oil used in this study, Oil4Life Balance, combines biologically active anti-inflammatory antioxidants from olives (flavonoids) and an optimal daily dose of Omega-3 from fish (the AMX formula). These two ingredients support each other in protecting cells against damage and in repairing injuries. Omega-3 fatty acids that circulate in the blood are activated rapidly in places where damage and inflammation occur locally. There, they are converted into biologically active substances (resolvins (RvD1), protectins) that ensure that the immune and inflammatory responses are not too strong. The olives contain highly effective flavonoids that protect the body against oxidative stress and excessive inflammation, as shown in international research (Covas, M. et al., 2006. *The effect of polyphenols in olive oil on health disease risk factors. Ann. Intern. Med. 145:33-341*).

The antioxidants from olives are carried on the same “boats” as the fatty acids in the blood stream, and protect the fatty acids both during transportation, and after they have been integrated into the cells. The level of flavonoids in these “boats” (LDL cholesterol) increases proportionally with the intake of flavonoids from olives. Studies show that people who eat olives (and are consuming olive flavonoids) have higher levels of ‘good’ cholesterol (HDL cholesterol) in the blood, which confers additional protection.

Most Omega-3 products contain added the antioxidant vitamin E. These products are badly and even dangerously designed. Vitamin E protects Omega-3 fatty acids while they are in the bottle, but not in the body (Sesso, H., D. et al., 2008. *Vitamins E and C in the prevention of cardiovascular disease in men. The Journal of the American Medical Association, vol. 300, no. 18, November 12, 2008*). They are not recommended for the adjustment of the Fatty acid balance since this requires a daily intake of more than 2 g Omega-3. If this kind of high dose omega-3 is taken without adequate biologically active antioxidants such as olive flavonoids, Omega-3 (and Omega-6) will tend to oxidise in the body while being transported to the cells. When this happens they start oxidative chain reactions that can lead to arterial and other damage.

Preventative Health with Oil4Life

The Oil4Life health concept measures and regulates the risk factors of Fatty acid balance, Omega-3 levels and the Omega-3/-6 ratio in the body. It also calculates your Protection against lifestyle diseases. Oil4Life is a dietary supplement that ensures that the Fatty acid balance is regulated and maintained at an optimal point; while simultaneously meeting daily requirements for Omega-3 from fish and protective biological antioxidants from olives (flavonoids). It also corrects the body's store of vital long-chain fatty acids (Omega-6 ratio).

Oil4Life was developed by Itogha AS in cooperation with the University of Milan, Italy, St. Olav's Hospital in Trondheim, Norway and Dr Paul Clayton, UK and consists of the following products:



Figure 7. The products of the Oil4Life health concept that measures, regulates and maintains at preferred levels the risk factors Fatty acid balance, Omega-3 level and Omega-6 share in the body, and calculates your Protection against lifestyle diseases.

- 1) **Oil4Life Test:** measures 11 different fatty acids in the blood and calculates the risk factors of Fatty acid balance, Omega-3 level, Omega-6 ratio and your Protection against lifestyle diseases
- 2) **Oil4Life Balance:** regulates the risk factors of Fatty acid balance, Omega-3 level and Omega-6 ratio over the course of 16 weeks and increases your Protection against lifestyle diseases
- 3) **Oil4Life Daily:** maintains Fatty acid balance, Omega-3 level and the Omega-3 /-6 ratio at the optimal level for health, and stabilises your Protection against lifestyle diseases
- 4) **Oil4Life Protect:** interacts with Oil4Life Daily in strengthening your immune system in the never-ending battle against environmental threats.