HS-Omega-3 Index® - report - reference sheet

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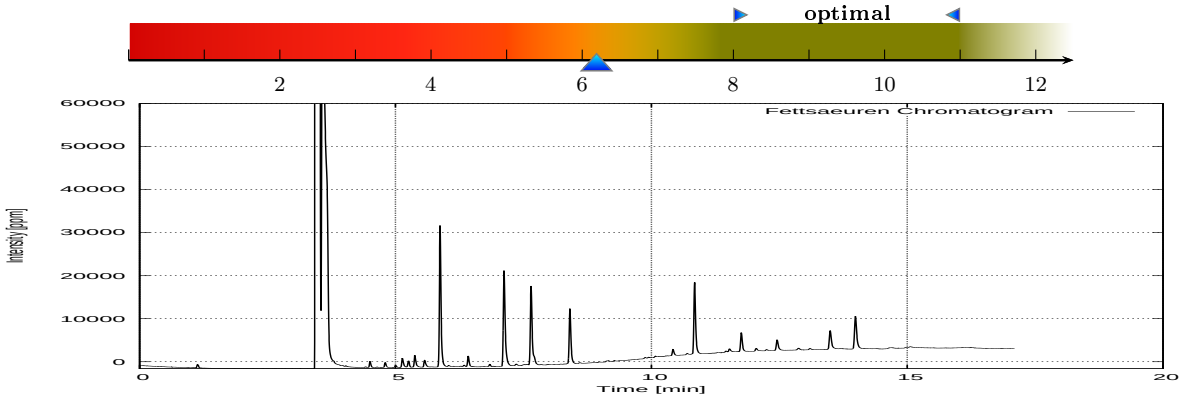
שם הנבדק

מספר זהות ופרטים מזהים

Your HS-Omega-3 Index is: 6.19%



Ω-3 fatty acids	
α-linolenic (ALA) 18:3 ω3	0.21%
Eicosapentaenoic (EPA) 20:5 ω3	0.32%
Docosapentaenoic-n3 (DPA) 22:5 ω3	1.88%
Docosahexaenoic (DHA) 22:6 ω3	5.87%
Range[2]: 3.1% – 20.8%	**Sum: 8.28%**

Monounsaturated fatty acids	
Palmitoneinic 16:1$n7$ ω7	0.11%
Oleic 18:1 ω9	13.60%
Gondonic 20:1 ω9	0.64%
Nervonic 24:1 ω9	0.36%
Range[2]: 11.6% – 29.3%	**Sum: 14.71%**

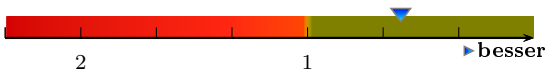
Ω-6 fatty acids	
Linoleic (LA) 18:2 ω6	12.60%
γ-linolenic (GLA) 18:3 ω6	0.08%
Dihomo-γ-linolenic (DGLA) 20:3 ω6	1.85%
Arachidonic (AA) 20:4 ω6	18.14%
Docosatetraenoic (DTA) 22:4 ω6	3.51%
Eicosadienoic 20:2 ω6	0.19%
Docosapentaenoic-n6 22:5$n6$ ω6	0.79%
Range[2]: 18.6% – 39.6%	**Sum: 37.16%**

Saturated fatty acids	
Myristinic 14:0	0.17%
Palmitinic 16:0	20.51%
Sterarinic 18:0	17.97%
Arachinic 20:0	0.14%
Behenic 22:0	0.13%
Lignocerinic 24:0	0.29%
Range[2]: 31.0% – 43.7%	**Sum: 39.21%**

fatty acids relations	
Omega-6 : Omega-3 (1:1 - 6.7:1)[2]	4.5:1
Poly-unsaturated fatty acids:Saturated	1.2
Arachidonic (AA) : Eicosapentaenoic (EPA)	56.7:1

Trans-Fatty acids	
Trans palmitoleic 16:1 ω7t	0.06%
Trans elaidinic 18:1 ω9t	0.48%
Trans linoleic 18:2 ω6t	0.11%
Range[2]: 0.1% – 2.1%	**Sum: 0.65%**

HS-Trans Index **0.59**



[1] k.A.: Not applicable. Value below minimal measure.
[2] The range is the AVG from 2000 random German subjects, it may differ in other populations.

Omegametrix GmbH

Report commentary

Your personal HS-Omega-3 Index

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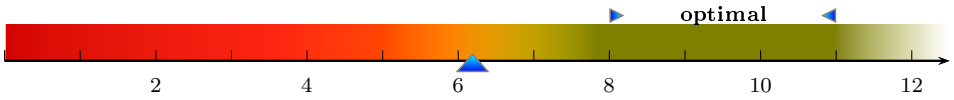
Your HS-Omega-3 Index is: 6.19%, and thus below the target range of 8% – 11%.



Knowing your HS-Omega-3 Index helps and enables you to improve your health. Structure and function of the heart, brain and muscles depend on the amount of Omega-3 fatty acids in their cells. Below we explain in more detail, how important your HS-Omega-3 Index is and how you can increase it.

Heart

A HS-Omega-3 Index within the target range of 8% – 11% is optimal. From the perspective of Omega-3 fatty acids, this means a maximal life expectancy and a minimal risk for the following cardiovascular diseases:

- Sudden cardiac death
- Fatal myocardial infarction
- Non-fatal myocardial infarction
- Development of and death from congestive heart failure

Moreover, an increase of the HS-Omega-3 Index lowers heart rate, increases heart rate variability, lowers blood pressure, lowers parameters of inflammation, blood lipids are improved and the "natural" course of atherosclerosis of coronary heart vessels is mitigated. Although the large intervention trials with clinical endpoints were not positive, due to methodological issues, most relevant cardiac societies recommend Omega-3 fatty acids for prevention of cardiovascular diseases. A low HS-Omega-3 Index is a cardiovascular risk factor according to the criteria of the American Heart Association. This topic is discussed in more detail in[1].

[1] von Schacky C. Omega-3 Fatty Acids in Cardiovascular Disease - an Uphill Battle. PLEFA 2015;92:41-7

Brain

To a large degree, the brain consists of Omega-3 fatty acids. Throughout life, the brain needs Omega-3 fatty acids to maintain structure and function and thus the brain depends on sufficient levels of Omega-3 fatty acids, represented by the HS-Omega-3 Index. With a HS-Omega-3 Index in the target range, the following issues are influenced in a positive way[2]:

- Brain development (structure and function) in babies, children and adolescents
- Attention- deficit-hyperkinetic syndrome (ADHD)
- Major depression in adolescents and adults
- Suboptimal brain structure and function in adults of any age
- Cognitive impairments in higher age

For all issues mentioned, evidence is provided by intervention trials and pertinent meta-analyses that increased intake of Omega-3 fatty acids, and thus an increase in the HS-Omega-3 Index, will improve them. This encompasses not just ADHD and major depression, but also complex brain performances at any age. Examples for the latter are memory, reaction time, "executive function" and others. Pregnant women should increase their intake of Omega-3 fatty acids, according to many nutrition societies, but avoid sources contaminated with toxins (see next page). It is recommended that pregnant women should also have a HS-Omega-3 Index in the target range of 8% – 11%[3].

Sports and Muscle

Athletes frequently have a deficit in Omega-3 fatty acids[4]. Compensating this deficit improves:

- Late onset muscle soreness, including reduced muscle damage, less inflammatory reaction and less loss of strength
- Reduces heart rate at submaximal workload, improves vessel function, and specific functions of the heart, lung and blood vessels

Evidence is provided by intervention trials, some of which were conducted on the basis of the Omega-3 Index[5]. Moreover, "age-dependent" declines in muscle mass and strength will not only be stopped, but reverted[6]. Therefore, we think that athletes, specifically competitive athletes, but also all others with an interest in their muscles, should have a HS-Omega-3 Index in the target range[7].

[2] von Schacky C. Hirnstruktur und Hirnfunktion: Rolle der Omega-3 Fettsäuren. Z Orthomol Med 2014;1:20-4

[3] von Schacky C. Schwangerschaft, kindliche Entwicklung, Omega-3-Fettsäuren und HS-Omega-3 Index. J Frauengesundheit 2010;3

[4] von Schacky C, Kemper M, Haslbauer R, Halle M. Low Omega-3 Index in 106 german elite winter endurance athletes: a pilot study. Int J Sport Nutr Exerc Metab. 2014;24:559-64.

[5] Kim J, Lee J. A review of nutritional intervention on delayed onset muscle soreness. Part I. J Exerc Rehabil. 2014;10:349-56

[6] Smith GI, et al. Fish oil-derived n-3 PUFA therapy increases muscle mass and function in healthy older adults. Am J Clin Nutr. 2015;102:115-22

[7] von Schacky C. Omega-3 Fettsäuren im Sport. Vitalstoffe 2015, ;5/4:10-16

Sources for Omega-3 Fatty Acids

Omega-3 fatty acids can be found in fish and in food supplements. Both contain varying concentrations in the two Omega-3 fatty acids eicosapentaenoic acid and docosahexaenoic acid. The concentrations in fish depend on the species, season, feed, activity and many other factors. Concentrations in capsules depend on the source (fish, krill, algae, others) and the production process. The amount present in capsules is usually displayed on the package, but sometimes requires some calculating. It is impossible to know the amount of Omega-3 fatty acids in fish. More importantly, it is impossible to predict the amount the HS-Omega-3 Index would increase, because the amount appearing in blood after ingestion varies widely from person to person. It is a fact that Omega-3 fatty acids are best ingested with the largest meal of the day. Thus we hope that you understand that we can not recommend a daily dose of Omega-3 fatty acids. We do, however, recommend a control of the HS-Omega-3 Index. Because of the lifespan of red blood cells this control makes only sense 3 – 4 months after increased intake of Omega-3 fatty acids at the earliest. Once the HS-Omega-3 Index is in its target range, yearly controls will suffice.

In terms of contaminants, Omega-3 fatty acids in capsules usually are nonhazardous. Long-living predatory fish like tuna, shark or sword-fish can contain amounts of methyl-mercury advising against consumption of large amounts, which is especially true for pregnant women. Salmon or mackerel usually are uncritical, and are also good sources of Omega-3 fatty acids.

Please note: Plant-derived omega-3 fatty acids (alpha-linolenic acid) do not increase the HS-Omega-3 Index.

Trans-Fatty Acids

Trans-fatty acids from milk, dairy products and meat, represented by trans-palmitoleic acid (C16:1ω7t), are harmless. According to our most recent data, a lower risk for death, especially sudden cardiac death, is associated with higher levels of trans-palmitoleic acid[8]. Trans fatty acids from industrial food production, represented by trans-oleic acid (C18:1ω9t) and isomers of trans-linoleic acid (C18:1ω6t), are also harmless at low concentrations, up to a sum of 1.04%[8]. Even more recent data indicates that 1.04% are rarely reached in Europe[9]. Results from whole blood (e.g. from a fingerprick) are less precise, and might mandate a determination in red blood cells, if the sum of trans-oleic acid (C18:1ω9t) and trans-linoleic acid (C18:2ω6t) should top 1,04%. In the rare case of values above 1.04% in red blood cells, we advise against deep-fried foods and hardened fats.

Whether this abstinence reduces the harmful trans fatty acids, can be measured in a control of the HS-Trans Index, which should be performed after 3 – 4 months at the earliest.

[8] Kleber et al, Trans FAs and Mortality in Patients referred for Coronary Angiography. Eur Heart J 2016;37:1072-82

[9] von Schacky et al, Trans Fatty Acid Levels in Erythrocytes in Europe. Eur J Nutr 2016, e-pub May 5