OmegaQuant Analytics
5009 W. 12th St, Suite 7
Sioux Falls, SD 57106
omegaquant.com

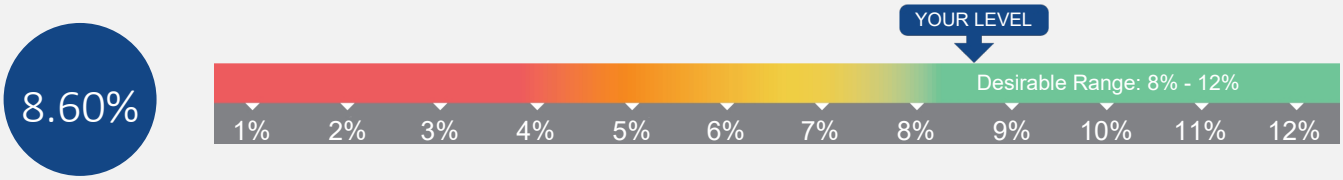
Omega-3 Index Complete Report

NAME: [redacted]
DOB: [redacted]
PATIENT ID: [redacted]
SAMPLE ID: [redacted]40

COLLECTION DATE: 3/19/2025
RESULT DATE: 3/31/2025
PROVIDER:
ACCOUNT: Emerson Ecologics

Your Omega-3 Index

Reference Range*: 3.00 - 14.10%



* Reference Ranges encompass about 99% of fatty acids levels measured in US adults. Visit our FAQ section for more information on ranges.

The Omega-3 Index is the proportion of long-chain omega-3s, eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), of all fatty acids in your red blood cell membranes. It reflects the omega-3 status of your body over the last 4 months, similar to how hemoglobin A1C reflects long-term glucose blood levels. As a part of an overall healthy lifestyle, an Omega-3 Index in the **8-12%** range may help to maintain heart, brain, eye and joint health. To increase your Omega-3 Index, eat foods rich in EPA and DHA, especially "oily" fish such as those in the accompanying table. They can also be obtained from dietary supplements (fish, krill, cod liver, algal oils) and functional foods (omega-3 enriched milk, eggs, etc.).

The amount of EPA and DHA needed to raise the Omega-3 Index into the desirable range is different for everybody. Many factors – age, sex, weight, diet, genetics, smoking habits, medications, and other medical conditions – can all influence the body's response to EPA and DHA. Still, we can provide an estimate, based on our own research, of how much EPA and DHA you may need to raise your level to the desirable range given your current Omega-3 Index level. Visit our Omega-3 Index Calculator on OmegaQuant.com to find out your personalized EPA and DHA recommendation.

The other main dietary omega-3 fatty acid, alpha-linolenic acid (ALA), is found in walnuts, flax and chia seeds. ALA can be converted to EPA and DHA in the body, but this happens at a very low rate in most people. An increase in ALA intake will have little to no effect on the Omega-3 Index.

Please consult with your healthcare provider before making any dietary changes. If you increase your intake of EPA and DHA, your Omega-3 Index will begin to slowly go up within a few days but will continue to change for 3-4 months. We recommend that you re-measure your Omega-3 Index in 3-4 months until you reach the desirable range. Once you reach the desirable range for Omega-3 Index, we recommend that you re-test every 6 months. Answers to commonly asked questions about your results can be found in the FAQ section on our website.

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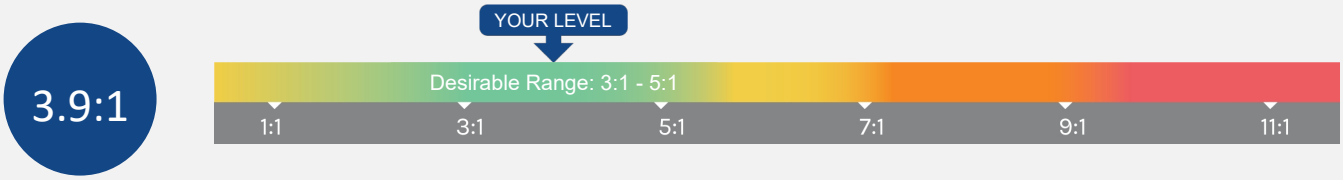
Omega Ratios Report

NAME: Joe Lavelle
DOB: 6/1/1962
PATIENT ID: JLavelle
SAMPLE ID: USA[redacted]36540

COLLECTION DATE: 3/19/2025
RESULT DATE: 3/31/2025
PROVIDER:
ACCOUNT: Emerson Ecologics

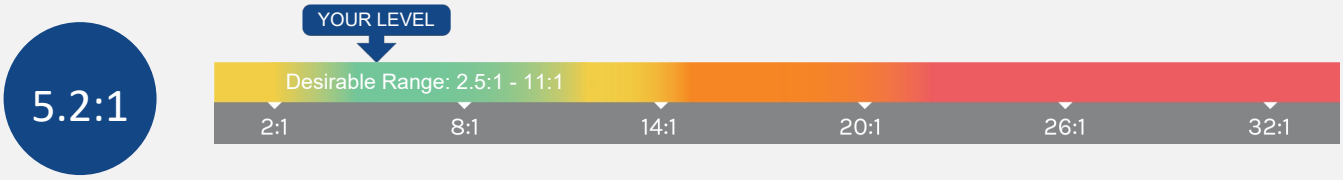
Omega-6:Omega-3

Reference Range*: 2.1:1 - 13.6:1



AA:EPA

Reference Range*: 1.3:1 - 59.9:1



* Reference Ranges encompass about 99% of fatty acids levels measured in US adults. Visit our FAQ section for more information on ranges.

Omega-6:Omega-3 (n6:n3) ratio is calculated by dividing the sum of seven omega-6 fatty acids by the sum of four omega-3 fatty acids in whole blood. Only one omega-6 fatty acid, arachidonic acid (AA), and one omega-3 fatty acid, eicosapentaenoic acid (EPA), make up the AA:EPA ratio. The desirable range for the Omega-6:Omega-3 ratio is 3:1 to 5:1, and the desirable range for the AA:EPA ratio is 2.5:1 – 11:1. The desirable ranges for the ratios were calculated to correspond to the desirable range for the Omega-3 Index due to the strong relationship among these metrics.

Higher omega-3 blood levels are strongly related to improved health and longevity. Similarly, higher - not lower - blood levels of the main omega-6 fatty acid, linoleic acid, have been associated with better heart and metabolic health. AA blood levels alone are a poor predictor of health outcomes. However, there is considerable controversy regarding omega-6s in the diet and health, which is beyond the scope of this report.

Please consult with your healthcare provider before making any dietary changes. The most efficient way to lower both the Omega-6:Omega-3 and the AA:EPA ratios is to consume more omega-3 EPA and DHA from fish or supplements (see attached table). Omega-6 blood levels are less responsive to dietary changes than omega-3 blood levels. Therefore, lowering dietary omega-6s as a strategy to correct these ratios is typically less effective than raising intake of EPA and DHA. It will take 3-4 months for these ratios to reach their new levels and we recommend re-testing at that time.

OmegaQuant Analytics
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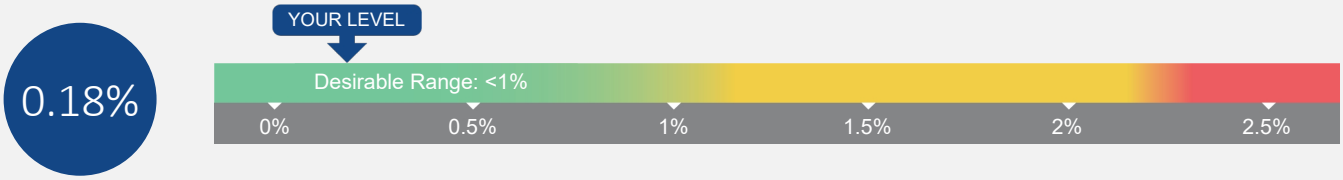
Trans Fat Index Report

NAME: Joe Lavelle
DOB:
PATIENT ID:
SAMPLE ID: USAH[redacted]40

COLLECTION DATE: 3/19/2025
RESULT DATE: 3/31/2025
PROVIDER:
ACCOUNT: Emerson Ecologics

Your Trans Fat Index

Reference Range*: 0.30 - 1.70%



* Reference Ranges encompass about 99% of fatty acids levels measured in US adults. Visit our FAQ section for more information on ranges.

The Trans Fat Index is the percent of 18:1 and 18:2 *trans* fatty acids of total fatty acids in red blood cell membranes, and the desirable range is **<1%**. *Trans* fatty acids (or *trans* fats) in our blood come only from the food we eat because our bodies cannot make them. *Trans* fats in the diet come from two sources: 1) industrial production by the "partial hydrogenation" of vegetable oils, in which liquid oils are converted into solid fats to be used in processed foods, and 2) meat and milk products of ruminant animals, like cows and goats. The fatty acids that make up the Trans Fat Index were chosen because they were typically found in processed foods, but a small amount may come from ruminant sources.

Higher intakes of *trans* fats from processed foods have led to higher Trans Fat Index levels. High *trans* fat blood levels and intake have been strongly related to heart disease. As such, the World Health Organization (WHO) has called on all countries to remove *trans* fats from their food supplies by 2023, and many countries have already achieved this. The relationship between ruminant *trans* fats and heart disease is not as clear. The amount of ruminant *trans* fats typically present in meat and dairy are very low, so normal intakes of these foods probably will not result in a high Trans Fat Index.

Traditionally, *trans* fats were abundant in processed foods, like baked goods, chips, and microwave popcorn. As *trans* fats have been removed from the food supply, however, eating processed foods has become less connected to blood *trans* fat levels. For example, since 2009, the average Trans Fat Index measured at OmegaQuant has decreased by half (from 1.7% to 0.8%), and in 2017 more than half of the samples submitted to OmegaQuant have a Trans Fat Index of <1%. Still, if you ate a lot of processed food in the past, your Trans Fat Index may be elevated.

Please consult with your healthcare provider before making any dietary changes. If your Trans Fat Level is <1%, there is no need to change your diet. If your Trans Fat Level is >1%, you may still be releasing stored *trans* fats that have built up over the years. Eating less processed food ensures you will not be eating any "hidden" *trans* fats that may still be in the food supply. We recommend you re-test every 6 months until your levels are <1%.

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Complete Fatty Acid Report

NAME: Joe Lavelle
DOB:
PATIENT ID:
SAMPLE ID: [redacted]40

COLLECTION DATE: 3/19/2025
RESULT DATE: 3/31/2025
PROVIDER:
ACCOUNT: Emerson Ecologics

Fatty Acid Group	Whole Blood Level	Reference Range*
Omega-3 Fatty Acids	**8.34%**	**2.80 - 13.90%**
Omega-3 Index	8.60%	3.00 - 14.10%
Alpha-Linolenic (18:3n3)	0.70%	0.09 - 2.04%
Eicosapentaenoic (EPA, 20:5n3)	1.79%	0.12 - 6.69%
Docosapentaenoic-n3 (22:5n3)	1.25%	0.38 - 2.98%
Docosahexaenoic (DHA, 22:6n3)	4.60%	0.45 - 6.37%
Omega-6 Fatty Acids	**32.57%**	**26.20 - 43.50%**
Linoleic (18:2n6)	20.94%	13.12 - 31.32%
Gamma-Linolenic (18:3n6)	0.04%	0.04 - 0.70%
Eicosadienoic (20:2n6)	0.23%	0.08 - 0.51%
Dihomo-y-linolenic (20:3n6)	0.73%	0.44 - 2.41%
Arachidonic (AA, 20:4n6)	9.28%	4.83 - 21.00%
Docosatetraenoic (22:4n6)	0.79%	0.25 - 2.33%
Docosapentaenoic-n6 (22:5n6)	0.57%	0.07 - 0.86%
cis-Monounsaturated Fatty Acids	**24.99%**	**16.10 - 30.20%**
Palmitoleic (16:1n7)	0.41%	0.11 - 2.87%
Oleic (18:1n9)	23.43%	12.05 - 30.28%
Eicosenoic (20:1n9)	0.31%	0.08 - 0.62%
Nervonic (24:1n9)	0.84%	0.16 - 2.91%
Saturated Fatty Acids	**33.88%**	**30.60 - 41.10%**
Myristic (14:0)	0.53%	0.04 - 2.35%
Palmitic (16:0)	20.87%	13.90 - 27.24%
Stearic (18:0)	10.37%	8.43 - 24.21%
Arachidic (20:0)	0.33%	0.08 - 0.50%
Behenic (22:0)	0.77%	0.23 - 1.52%
Lignoceric (24:0)	1.01%	0.18 - 2.69%
Trans Fatty Acids	**0.22%**	**0.30 - 1.90%**
Trans Palmitoleic (16:1n7t)	0.04%	0.01 - 0.54%
Trans Oleic (18:1t)	0.09%	0.06 - 1.22%
Trans Linoleic (18:2n6t)	0.08%	0.05 - 0.88%
Trans Fat Index	0.18%	0.30 - 1.70%
Ratios		
AA:EPA	5.2:1	1.3:1 - 59.9:1
Omega-6:Omega-3	3.9:1	2.1:1 - 13.6:1

* Reference Ranges encompass about 99% of fatty acids levels measured in US adults. Visit our FAQ section for more information on ranges.

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Complete Fatty Acid Report

NAME: Joe Lavelle
DOB: 6/1/196[illegible]
PATIENT ID: JL[illegible]
SAMPLE ID: USAH05[illegible]40

COLLECTION DATE: 3/19/2025
RESULT DATE: 3/31/2025
PROVIDER:
ACCOUNT: Emerson Ecologics

Using fatty acid profiles to assess health is a new and evolving field. There is not agreement in the scientific community on what many fatty acid levels "mean" for health. Besides the Omega-3 Index and Trans Fat Index, the additional fatty acid values provided here are primarily for your information. In addition, individual fatty acid values are from whole blood (including plasma, red and white blood cells), while the Omega-3 Index is a level of omega-3s in red blood cells specifically. Please consult with your healthcare provider before making any dietary changes based on these results.

Omega-3 Fatty Acids

The four omega-3 fatty acids reported here include the “plant” omega-3 (alpha-linolenic acid, ALA) and the three "marine" omega-3s (EPA, DHA and DPA n-3). ALA is one of the two essential fatty acids in the diet, meaning, like a vitamin, we cannot make it and have to get it from our diet. An adequate intake of ALA is about 1.5 grams per day, which is about the average intake in the US. ALA comes primarily from soybean and canola oil (which are a component of many processed foods), but also specialty foods/oils are particularly rich sources, e.g., chia seed oil, flaxseed oil, black walnuts.

Technically, the marine fatty acids are not essential because they can be made from ALA by the body. However, the conversion process from ALA to EPA and DHA is very inefficient in most adults, which makes getting EPA and DHA from the diet important. We have created an Omega-3 Index Calculator on our website to help you figure out how much EPA and DHA you may need to consume in order to achieve an Omega-3 Index of 8%. Please note that the EPA and DHA values listed do not add up to the Omega-3 Index. This is because the EPA and DHA levels are from whole blood levels, and the Omega-3 Index is from red blood cells. At present, there is not enough research to recommend target blood levels for ALA or DPA n-3.

Omega-6 Fatty Acids

We measure levels of seven fatty acids in the omega-6 family, but linoleic (LA) and arachidonic acids (AA) make up the vast majority of the total omega-6 level. LA is an essential fatty acid, like ALA, and is the starting material for the synthesis of the other omega-6s. The level of LA in your blood is largely influenced by the amount of LA you eat. LA is found in foods ranging from processed foods to vegetable oils to seeds and nuts. The level of AA in the blood is more controlled by metabolism than LA, but a diet high in meat and eggs can slightly increase it. The other five omega-6 fatty acids are primarily determined by your body’s metabolism and are less well studied. The adequate intake for LA as an essential fatty acid currently is set at 11-14 grams per day for women and 14-16 grams per day for men.

There is controversy regarding whether LA and AA (or omega-6s in general) are “good” or “bad” for our health. Some studies link higher intake of omega-6s to higher inflammation in the body, which is a part of many chronic disease processes. This is partially because AA is the starting material for the production of many “pro-inflammatory” molecules. Others disagree, noting that in many studies, higher amounts of LA in the diet or in the blood are associated with better heart and metabolic health. Clearly, more research is needed.

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Complete Fatty Acid Report

NAME: Joe Lavelle
DOB:
PATIENT ID:
SAMPLE ID: 240

COLLECTION DATE: 3/19/2025
RESULT DATE: 3/31/2025
PROVIDER:
ACCOUNT: Emerson Ecologics

cis-Monounsaturated Fatty Acids ("Monos")

There are four fatty acids in this class, but 95% of “monos” are from one fatty acid, oleic acid. Oleic acid is in many vegetable oils, including olive, canola, safflower, sunflower, and soybean. It is a part of virtually everyone’s diet, and it is also made by the body, i.e., it's not an "essential" fatty acid. Although found in relatively high amounts in the blood of people on a Mediterranean Diet (due to the large intake of olive oil), the relationship between blood oleic acid levels and health is somewhat controversial. We cannot provide a strong, research-based recommendation for a desirable blood oleic acid range or corresponding dietary advice to change levels. Because oleic acid levels come from both what you eat and what your body makes, it is difficult to change blood levels and it is unknown if simply changing them has any impact on your health.

The other fatty acid in this family that merits comment is palmitoleic acid. It is normally present at around 1% of total fatty acids in your blood, but it is being recognized as a marker of excess carbohydrates in the diet. High intakes of simple carbohydrates, e.g., sugar, white flour, corn syrup, etc., cause the body to make fatty acids, one of which is palmitoleic acid. Again, the research in this field is immature and does not allow for firm target values to be set. (Note: if you are taking a palmitoleic acid supplement, the relationship between carbohydrate intake and blood levels of this fatty acid becomes complex and hard to interpret.)

Saturated Fatty Acids

There are six saturated fatty acids in the OmegaQuant Complete Report. As with the other classes described above, the vast majority of saturated fatty acids are from two fatty acids: palmitic and stearic acid. Together they make up ~98% of the saturated fatty acids in the blood, with palmitic making up two-thirds of the total. Foods rich in saturated fatty acids are solids at room temperature, such as butter, shortening and lard. However, eating foods high in saturated fat **does not** cause an increase in whole blood saturated fatty acid levels, but excess carbohydrate intake can. Like palmitoleic acid, palmitic acid is both consumed and made by the body, especially when carbohydrate intake is high, so it is difficult to interpret the meaning of palmitic acid blood levels. Stearic acid does not appear to have any important health implications, but higher palmitic acid levels have been linked to poorer overall health.

Trans Fatty Acids

Refer to your Trans Fat Index report for information relating to these fatty acids.

Ratios

Refer to your Omega Ratios report for information relating to these ratios.

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Amount of EPA and DHA in Seafood and Supplements

Fish and Seafood (3 oz or 85 g)	EPA (mg)	DHA (mg)	EPA + DHA (mg)
Pacific Herring	1056	751	1807
Atlantic Herring	773	939	1712
Atlantic Salmon (wild)	349	1215	1564
Bluefin Tuna	309	970	1279
Atlantic Salmon (farmed)*	510-587	680-1238	1190-1825
Pink Salmon (wild)	456	638	1094
Coho Salmon (farmed)	347	740	1087
Mackerel (canned)	369	677	1046
Sockeye Salmon (wild)	451	595	1046
Chum Salmon (canned)	402	597	999
Rainbow Trout (farmed)	284	697	981
Coho Salmon (wild)	341	559	900
Sardines (canned)	402	433	835
Albacore (or white) Tuna (canned)	198	535	733
Shark (raw)	267	444	711
Swordfish	117	579	696
Sea Bass	175	473	648
Pollock	77	383	460
Flat Fish (Flounder/Sole)	207	219	426
Blue Crab	207	196	403
Halibut	77	318	395
Oysters (farmed)	195	179	374
King Crab	251	100	351
King Mackerel	148	193	341
Walleye	93	245	338
Dungeness Crab	239	96	335
Scallops	141	169	310
Skipjack Tuna	77	201	278
Mixed Shrimp	145	122	267
Clams	117	124	241
Yellowfin Tuna	40	197	237
Light Chunk Tuna	40	190	230
Catfish (wild)	85	116	201
Catfish (farmed)	42	109	151
Cod	3	131	134
Mahi-Mahi (dolphin fish)	22	96	118
Tilapia	4	111	115
Orange Roughy	5	21	26
Dietary Supplements – Amount (mg) per capsule or per teaspoon			
Standard Fish Oil Capsules	180	120	300
Fish Oil Concentrates (many varieties)	100-400	100-400	300-700
Cod Liver Oil (teaspoon)	300	500	800
Krill Oil	100-300	50-150	150-450
Algal Oil	50-150	100-300	150-450

Table adapted from Harris et al. Current Atherosclerosis Reports 2008;10:503-509. Values based on USDA Nutrient Data Lab values and are for fish cooked with dry heat unless otherwise noted.

*Farmed Salmon can have a range of EPA and DHA based on the fish feed. Sprague M, et al. Scientific Reports, 2016; 6:21892.