Gnosis Laboratories (M) Sdn. Bhd. (577284-A)
HQ: 1-1 & 1-2, Jalan USJ 21/11, 47630 Subang Jaya, Selangor
Tel: 603-58858501/ 8502/ 8503, 603-58858510

SAMPLE REPORT

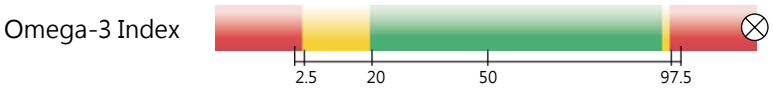
Profile: : FNFAD: Fatty Acid profile

## Fatty Acid Analysis (Membrane)

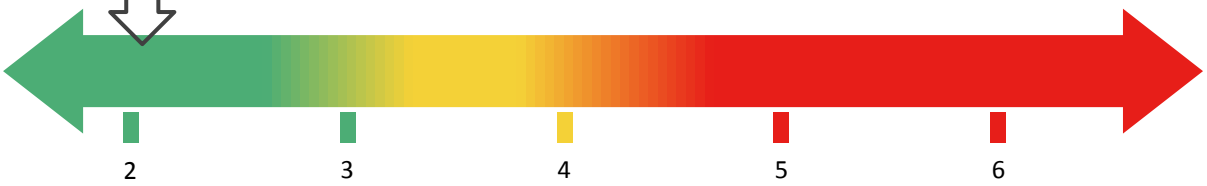
Your Omega-3 Index: 12.98 %


According to the study of Dr. Bill Harris published in AJCN, omega-3 index represented the EPA+DHA ratio in RBC membrane indicates the risk factor of coronary heart disease mortality, especially sudden cardiac death. Dr. Bill Harris considers **omega-3 index >8 as low risk of chronic diseases**. Maintaining optimal omega-3 index decreases the risk of degeneration diseases. doi.org/10.1093/ajcn/87.6.1997S

※ According to REDOX Laboratory statistics, the normal range of omega-3 index in Taiwan is **3.02-10.3**. Your result:

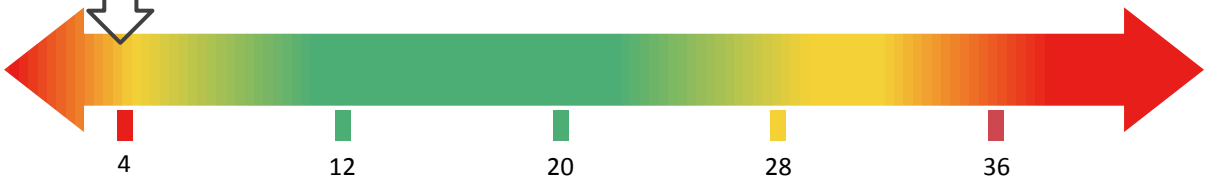



Your Omega-6/3 Ratio 1.7




**Optimal Omega-6/3 ratio is below 3.** Several sources of information suggest that human beings evolved on a diet with an optimal ratio of omega-6 to omega-3 essential fatty acids (EFA) of approximately 1 whereas in Western diets the ratio is 15-16.7, which might be one of the risk factors of CVD, cancer, inflammation, and autoimmune diseases. Studies suggest people should intake more recommended omega-3 like EPA while omega-6 to omega-3 ratio is too high. DOI: 10.1016/s0753-3322(02)00253-6

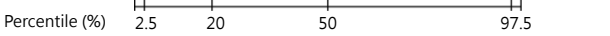
Your AA/EPA Ratio 3.5




**Optimal AA/EPA range is 4-36.** Increased AA/EPA ratio indicates too many inflammatory omega-6 i.e. arachidonic acid in the body. High proportion of meat and corn oil in western lifestyle contributes to high arachidonic acid. High AA/EPA ratio suggests omega-3 supplementation, e.g. EPA in order to prevent cognitive dysfunction, cancer, inflammation and autoimmune diseases.

## Fatty Acid Analysis (Membrane)

| **Omega-3 Fatty Acid** | | | Result (%) | Reference |
|---|---|---|---|---|
| 1. α-Linolenic (ALA) | C18:3n3 | | 0.066 | 0.06-0.24 |
| 2. Eicosapentaenoic (EPA) | C20:5n3 | | 3.75 ↑ | 0.22-2.49 |
| 3. Docosahexaenoic(DHA) | C22:6n3 | | 9.23 ↑ | 2.79-8.11 |
| 4. Omega-3 total | | | 13.05 ↑ | **3.29-10.5** |



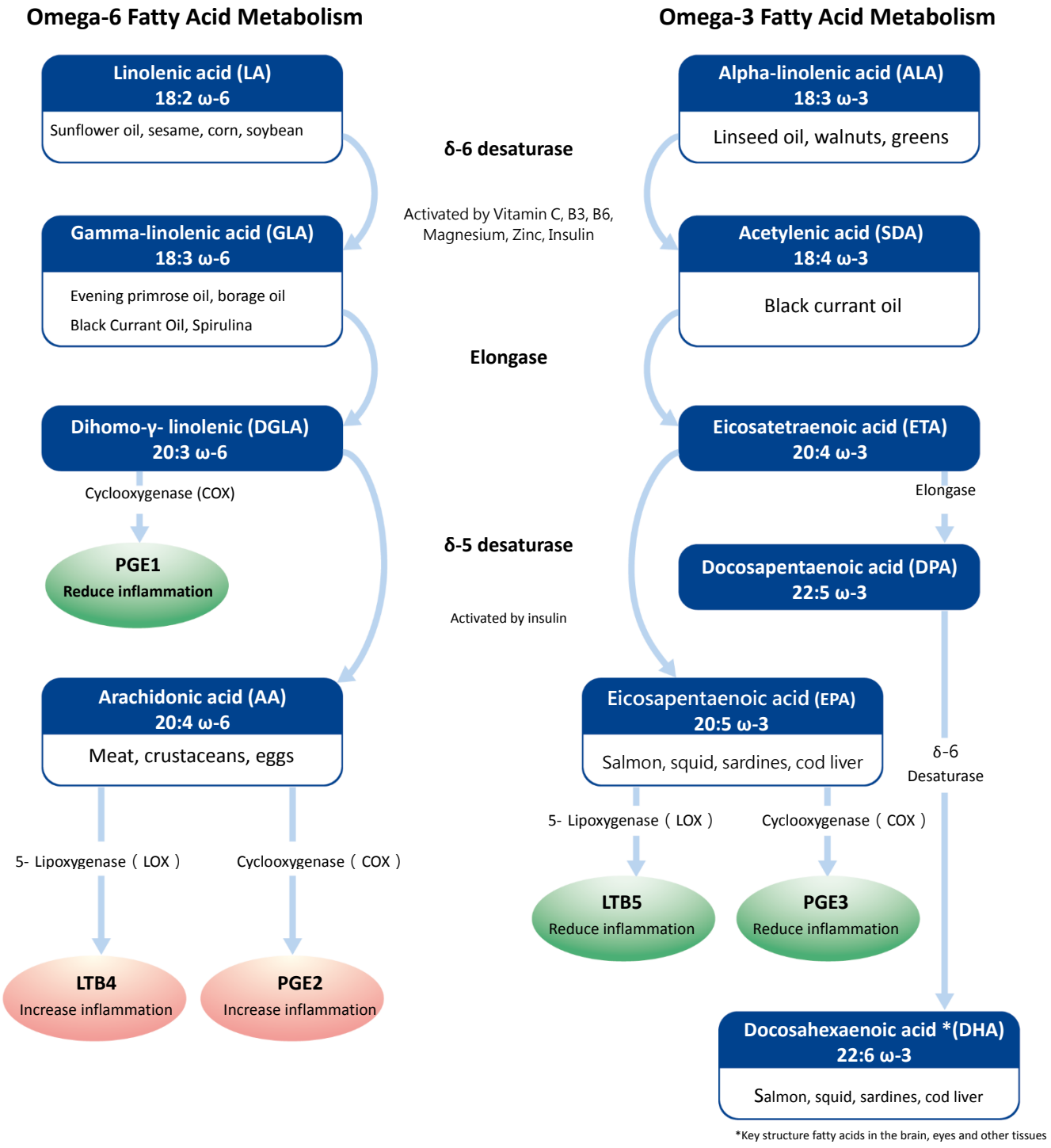

| **Omega-6 Fatty Acid** | | | Result (%) | Reference |
|---|---|---|---|---|
| 5. Linoleic (LA) | C18:2n6 | | 8.77 ↓ | 9.21-15.1 |
| 6. γ-Linolenic (GLA) | C18:3n6 | | 0.010 | 0.005-0.054 |
| 7. DGLA | C20:3n6 | | 0.79 | 0.78-1.51 |
| 8. Arachidonic (AA) | C20:4n6 | | 13.18 | 12.2-17.0 |
| 9. Omega-6 total | | | 22.75 ↓ | **24.2-32.0** |


| **Unsaturated Fatty Acids** | | | Result (%) | Reference |
|---|---|---|---|---|
| 10. Oleic | C18:1n9 | | 13.28 | 10.9-14.9 |
| 11. Nervonic | C24:1n9 | | 3.72 | 2.95-5.19 |
| 12. MUFA total | | | **17** | **14.7-19.5** |


| **Saturated Fatty Acid** | | | Result (%) | Reference |
|---|---|---|---|---|
| 13. Palmitic acid | C16:0 | | 27.67 | 25.1-28.8 |
| 14. Stearic acid | C18:0 | | 13.23 | 12.1-15.1 |
| 15. Behenic acid | C22:0 | | 1.29 | 1.27-2.22 |
| 16. Lignoceric acid | C24:0 | | 4.09 | 3.48-5.20 |
| 17. SFA total | | | **46.28** | **44.2-49.2** |


| **Trans Fat** | | | Result (%) | Reference |
|---|---|---|---|---|
| 18. Trans fatty acids | | | 0.093 ↑ | **≦0.085** |

## Fatty Acid Analysis (Membrane)



# Fatty Acid Analysis (Membrane)

**< Report Description >**

More and more medical studies have found that the intake of fatty acids from the diet affects the physical function and health of the body. The health problems of most modern people are caused by imbalances in fats and oils in the diet. They generally lack oils from fish, vegetables, whole grains, nuts, and seeds, and they also consume excessive processed and artificial fats. Long-term oil imbalance can result in the continued lack of essential fatty acids (EFAs), leading to the development of a variety of related diseases. Although excessive animal fat is associated with an increase in many chronic diseases, insufficient intake also increases the occurrence of other diseases. In women, the status of estrogen and related hormones are affected by the state of essential fatty acids, while men's androgen is also significantly affected by the state of fatty acids in the body. The fatty acids in the body and their metabolic results directly affect the occurrence of many diseases, including obesity, diabetes, cancer, heart disease, genetic diseases such as cystic fibrosis, as well as autoimmune diseases such as rheumatoid arthritis, multiple sclerosis. Clinically, the results obtained from the Fatty Acid Analysis will help to adjust diet patterns and how to supplement essential fatty acids (EFA) or other nutrients related to fatty acid metabolism such as vitamins and minerals.

**Omega-3 Fatty Acid**：

2. Eicosapentaenoic acid (EPA)
Eicosatetraenoic acid (EPA) is anti-inflammatory and should balance the levels of pro-inflammatory arachidonic acid. Although EPA can be produced from the essential fatty acid, ALA, dietary intakes of this fatty acid are generally poor. The conversion also requires the action of the Δ6 desaturase enzyme that may be low due to inadequate Zn, Mg, or vitamins B3, B6, and C. Such an enzyme impairment would be indicated if EPA is low and ALA is normal or high. High levels of saturated, monounsaturated, trans fatty acids, and cholesterol also slow the conversion of ALA to EPA (as well as GLA to DGLA). EPA inhibits the conversion of DGLA to arachidonic acid (AA), reduces the production of inflammatory precursors, has anti-inflammatory properties, reduces triglyceride synthesis, antithrombotic, lowers blood pressure, and repairs vascular endothelial function.
Dietary sources：Fish with high fat content such as salmon, mackerel, mackerel, sardines, shellfish, and squid.

3. Docosahexaenoic acid (DHA)
The growth and development of the central nervous system is particularly dependent upon the presence of an adequate amount of the very long chain, highly unsaturated fatty acids, docosapentaenoic acid (22:5n3) and docosahexaenoic acids (22:6n3). Docosahexaenoic acid (DHA) is an important member of the very long chain fatty acids (C22 to C26) that characteristically occur in glycosphingolipids, particularly in the brain. Since this fatty acid is so important in early development, it is worth noting that the levels in breast milk are correlated with the mother’s intake of fish oils, which are rich sources of both of these fatty acids. DHA intake may also help to lower blood pressure.
Dietary sources：Fish with high fat content such as salmon, mackerel, mackerel, sardines, shellfish, and squid.

4. Omega-3 Fatty acid
It is mainly found in fish and is an important nutrient that is considered to be beneficial to the body and cannot be synthesized by human, it must be fully available from foods, especially those rich in fat fish. Omega-3 fatty acids play an important role in brain function, growth and development, and at the same time can reduce the risk of heart disease. The American Heart Association recommends eating at least twice a week of fat-containing fish food.

**Omega-6 Fatty Acid**：

## Fatty Acid Analysis (Membrane)

5. Linoleic acid (LA)
Linoleic acid (18:2n6) is by far the most abundant polyunsaturated fatty acid in most human tissues. Linoleic acid (LA) is an essential fatty acid, and low levels indicate dietary insufficiency, which can lead to a variety of symptoms. Some of these symptoms result from lack of LA in membranes, where it plays a role in structural integrity. Most, however, are from failure to produce eicosanoids, which are cell regulators. Dietary sources especially corn oil is abundant, however, LA may be found above normal. Excessive LA can contribute to inflammation. Supplementation with LA has been shown to increase body weight and essential fatty acid status in patients with cystic fibrosis

9. Omega-6 Fatty acid
It is also an important fatty acid that is good for the body but cannot be synthesized by human and can only be taken from food. Like Omega-3 fatty acids, it is very important for brain function and growth, and is also a member of the PUFA family. Omega-6 fatty acids help promote hair and skin growth, maintain bone health, and regulate metabolism function and maintain the health of the reproductive system.

**Trans Fatty Acid**：

18. Trans Fatty Acid
The presence of these eighteen-carbon long trans fatty acids in human tissue can disrupt or impair cell membrane function. A patient with high levels of total C18 *trans* isomers should be told to avoid hydrogenated oil. These fatty acids contain one double bond and thus are included in the unsaturated category. Because of the geometry of the trans bond, however, they behave like saturated fats on the one hand, leading to elevated cholesterol levels. On the other hand, they mimic unsaturated fats that bind to desaturase enzymes and antagonize the normal production of necessary products. The net effect is to raise plasma LDL cholesterol and lower HDL. It is now the consensus among experts in lipid nutrition that foods containing hydrogenated oils are to be avoided. These fatty acids are also produced by the bacteria in the gut of ruminant animals which is the reason that beef and milk contain small amounts (13%) of elaidic acid. Moderate use of these foods is unlikely to provide *trans* fatty acids at levels that are of concern.

***The report is for physicians' reference only ***