TEST RESULTS:

Cod. ID: 123456
CCV: 2c9
Date: 01/01/2013
Patient: Rossi Mario

Rapport de:
NatrixLab
Via Cavallotti, 16
42122 Reggio Emilia
Aut.n. 67 del 26.01.10
Direttore Sanitario
Dott. Michele Cataldo
www.natrixlab.it

LIPIDOMIC PROFILE MEMBRANE
Assessment of the lipidomic profile of the erthyrocyte membrane

Rossi Mario

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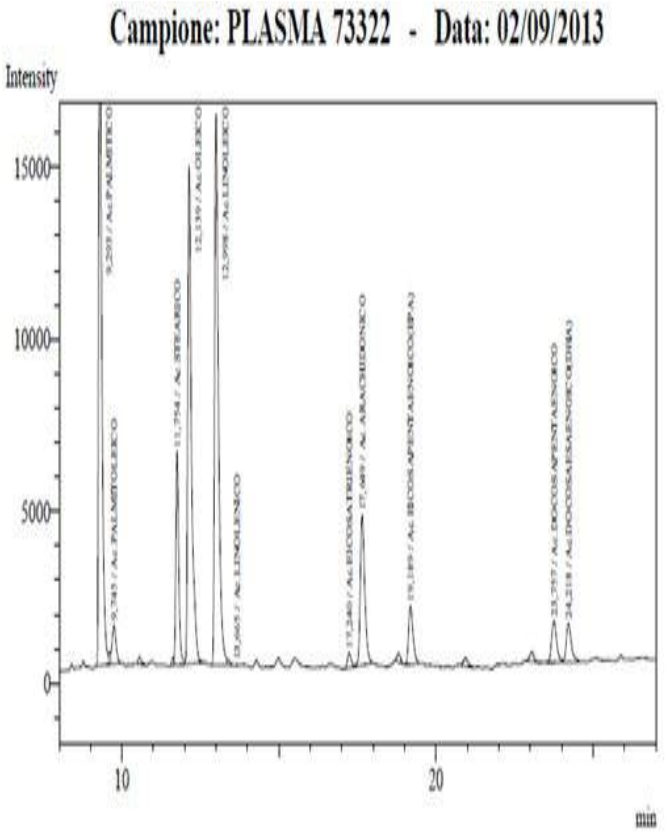
Via Cavallotti, 16
42122 Reggio Emilia
Tel. (+39) 0522 232606



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Percentage distribution of fatty acids of erythrocyte membrane

Analyte	Description	Result (%)
Palmitic acid	C 16:0	**24.11**
Palmitoleic acid	C 16:1	**0.88**
Stearic acid	C 18:0	**14.70**
Oleic acid	C 18:1	**21.78**
Linoleic acid	C 18:2	**17.24**
Docosahexaenoic acid	C 22:6	**2.81**
Docosapentaenoic acid	C 22:5	**4.15**
Eicosapentaenoic acid	C 20:5	**0.94**
Arachidonic acid	C 20:4	**12.19**
Eicosatrienoic acid	C 20:3	**1.06**
Linolenic acid	C 18:3	**0.14**

	Result (%)	(*) Ideal Values (%)	
		With n-3 integration	Without n-3 integration
SFA Summary	**38.81**	38.70 - 56.10	38.40 - 57.20
MUFA Summary	**22.66**	17.10 - 25.60	17.50 - 26.70
PUFA Summary	**38.53**	19.90 - 43.50	14.90 - 45.10

(*) The ideal values refer to clinically healthy Italians. The minimum and maximum values are arbitrary and are the result of experimental studies

AA/EPA Ratio	**13.00**
AA/DHA Ratio	**4.34**

In clinically healthy subjects taking omega-3, the ideal AA/EPA ratio varies from 12.80 to 16.30

Laboratory Manager
Dott.ssa Ausilia Rausa

ATTACHMENT:

Useful remarks for patient and doctor, to be associated to the analytical results. Your doctor should interpret this report.

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WHAT ARE FATTY ACIDS

GUIDE TO THE FATTY ACIDS TESTED

- omega-3 fatty acids

- omega-6 fatty acids

- Monounsaturated fatty acids (MUFA)

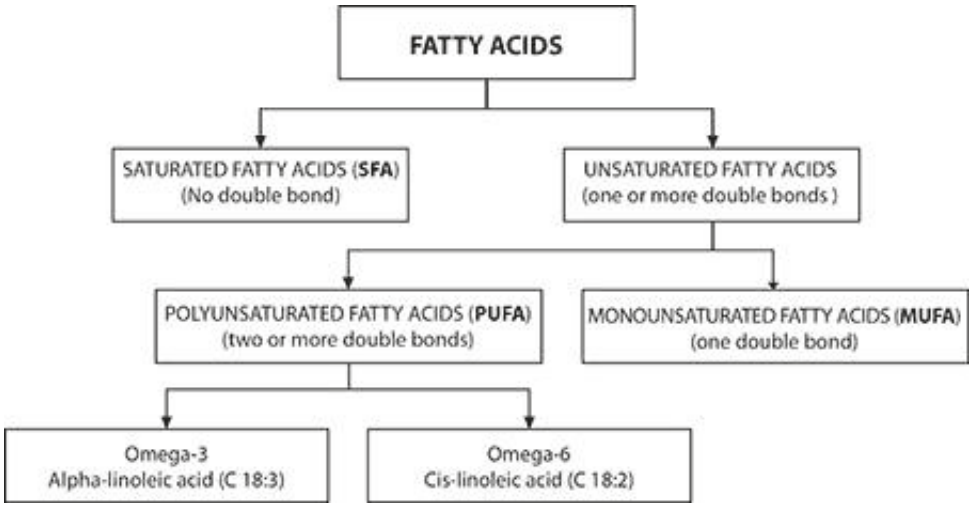
- Saturated fatty acids (SFA)

AA/EPA RATIO

FOODS RICH IN omega-3

WHAT ARE FATTY ACIDS?

The term fat does not just refer to the visible deposits of fat which may be more or less unsightly. "Hidden" inside every cell of the body are other fats which perform important functions: **fatty acids**, with energetic, metabolic and structural functions.
Fatty acids are the precursors of substances similar to powerful local hormones (eicosanoids), important for their role in controlling inflammation, the immune response and blood pressure. Fatty acids can be classified into saturated (SFA) and unsaturated fatty acids. The latter divide into monounsaturated (MUFA) and polyunsaturated (PUFA) fatty acids.



GUIDE TO THE FATTY ACIDS TESTED

Omega-3 fatty acids (n-3)

- *alpha-linolenic acid* **(C 18:3; LNA)**: considered the forefather of n-3 fatty acids. Recent studies shows that a diet rich in LNA reduces mortality due to cardiovascular disease.
- *eicosapentaenoic acid* **(C 20:5; EPA)**: has important antiaggregant properties. In addition it competes with arachidonic acid to prevent its conversion into inflammatory metabolites.
- *docosahexaenoic acid* **(C 22:6; DHA)**: has a mainly structural function, its primary role is that of making the cellular membrane fluid. It also plays an important role in the development and maturation of the brain, retinal tissue and reproductive system.
- *docosapentaenoic acid* **(C 22:5; DPA)**: the levels found in the blood can be correlated with improved insulin resistance in type 2 diabetic patients.

Omega-6 fatty acids (n-6)

- *linoleic acid* **(C 18:2; LA)**: considered the *precursor of n-6 fatty acids*. Molecules having a pro-aggregant and pro-inflammatory function derive from AA, which in turn derive from this. This fatty acid is present in high concentrations in seed oils.
- *arachidonic acid* **(C 20:4; AA)**: considered the precursor of pro-inflammatory molecules. Appropriately balanced with the DHA acid of the n-3 series it is important for the development of the embryo and growth of the child.

Monounsaturated fatty acids (MUFA)

The most widespread in nature are oleic acid and palmitoleic acid. Oleic acid in particular, present in olive oil in high concentrations, lowers total cholesterol levels and helps to increase HDL levels (good cholesterol).

Saturated fatty acids (SFA)

As is known, SFAs are considered harmful fats for the organism. They contribute calories, and increase stiffening of the cellular membrane, reducing its permeability.

Consumed in excess quantities, they may raise the level of cholesterol, increase the risk of cardiovascular disease, obesity, the onset of diabetes and metabolic syndrome. The main sources of SFA are meat (white meats such as chicken and turkey to a lesser extent), butter, dairy products, with a prevalence in mature cheeses, hydrogenated fats such as margarine, coconut and palm oil (widely used in industrially made products such as biscuits) and peanut seed oil.

- *palmitic acid* **(C 16:0)** and *stearic acid* **(C18:0)**: high levels may be associated with the risk of contracting cardiovascular diseases.

AA/EPA RATIO

Among the essential fatty acids (which should be eaten in the form of food) arachidonic acid (AA) and eicosapentaenoic acid (EPA) are considered very important for the health and well-being of the body. AA belongs to the class of omega-6 fatty acids and EPA to the omega-3 fatty acids. In actual fact, what counts most is **maintaining the right balance of omega-6 and omega-3. The quantity and quality of essential fatty acids introduced through diet influences the quantity of omega-3 and omega-6** present in the body and as a result, the production of eicosanoids (prostaglandin, leukotrienes and thromboxanes). Maintaining the right balance of omega-6 and omega-3 is important for preventing some diseases (e.g. cardiovascular disease). It is also important in specific physiological conditions, such as pregnancy and ageing.

As representatives of the two classes, to provide an index of this ratio the levels of arachidonic acid (AA) and eicosapentaenoic acid (EPA) are considered. The **AA/EPA** ratio indicates whether the patient's assumption of omega-6 and omega-3 is balanced.

Knowing the AA/EPA ratio of the cell membrane makes it possible to check the effective incorporation in the membranes of the fatty acids introduced through diet and supplements.

The **ideal** values of the ratio of these two fatty acids (AA/EPA), relative to the membrane of the red blood cells, varies depending on the assumption or not of supplements of essential fatty acids. In particular, as may be observed from the reference parameters relative to the AA/EPA ratio in the membrane of the red blood cells, in clinically healthy subjects taking omega-3, the ideal AA/EPA ratio varies **12.80 to 16.30**.

An ideal AA/EPA ratio makes for:

- a more efficient immune system;
- the inhibition of inflammatory phenomena (which many invalidating diseases derive from);
- a reduction of the level of triglycerides in circulation;
- a regression of the arteriosclerotic process.

It is believed that an optimised AA/EPA ratio may lead to an improvement of the general state of psycho-psychical wellbeing.

According to the latest scientific research, when the AA/EPA ratio exceeds the ideal value, one should adapt one's diet to increase the level of omega-3 or more simply supplement the diet with high dose compounds of omega-3 (e.g. fish oil). It's important not to overdo consumption of omega-3. It has been seen in fact that an excessive consumption may in some cases reduce the immune system functions, exposing the body to infection.

FOODS RICH IN omega-3

Analysing the content of omega-3 in foods is very important.

In our society cereals are the main source of food, but are a relatively recent addition to the human diet (introduced not more than 10,000 years ago) and are a change from the food we are genetically programmed to eat. The percentage content of omega-6 of cereal products is very high, while the percentage of omega-3 is very low and the amount of anti-oxidants practically nil. This does not mean that one has to eliminate cereal products from the diet but merely moderate their consumption in favour of foods high in omega-3 essential fatty acids.

Omega-3 are present mainly in fish, (of which the richest are **salmon, sardines, herring, mackerel and tuna**). It should be remembered that the method of cooking fish products greatly alters the content of fatty acids, to the detriment of the omega-3, as with frying. Omega-3 are also present in some plants and several animal foods such as **chicken, turkey and eggs**, although it should be remembered that in meat the omega-6/omega-3 balance is decidedly in favour of the former. Omega-3 are instead, practically absent in salamis and cheeses. It is interesting to note that farm-bred animals have practically the same omega-6/omega-3 ratio as those in the wild, but a higher quantity of saturated fatty acids, so that from a health point of view they may be a source of risk for various diseases (such as cardiovascular disease). The omega-3 fatty acid most present in vegetables is alpha-linolenic acid, mainly present in **green leaf vegetables, pulses, dried fruit, linen and soya oil, rapeseed extract.** This fatty acid is transformed into EPA and into DHA. The latter are decisive for proper functioning of the brain, retina and gonads and have a protective function against the onset of cardiovascular disease.

An excessive reduction of omega-3 fatty acids may be characterised by neurological symptoms, reduced visual acuity, skin lesions, delayed growth, reduced learning abilities.

THE LEVEL OF OMEGA-3

The **daily dose of omega-3 fatty acids recommended by the Italian Society of Human Nutrition** in a healthy adult subject is around **1-1.5 grams**. After a period of **2-3 months,** the supplement should bring the ratio towards the ideal figure. After reaching this level it is essential to optimise the assumption of omega-3 so as to keep the AA/EPA level around the ideal value.

Supplements should be taken bearing in mind the analytic results of the LIPIDOMIC PROFILE, but each case should be assessed on its own merits, bearing in mind the clinical history of the patient, of disease, of particular physiological states, such as pregnancy, breast-feeding, old age. For such reasons **always consult your GP or a specialist to decide the best supplement both in terms of type and quantity.**

In the presence of other conditions especially consult your doctor or a nutrition specialist to optimise the supplement and decide when to perform the LIPIDOMIC PROFILE assessment and to correctly interpret the results. It is to be emphasised that in an apparently healthy subject the assumption of omega-3 refers to a dietary supplement notified by the Ministry of Health and not to a medication.

Before commencing treatment with fatty acid supplements it is of crucial importance to find out your oxidative state. It has been scientifically demonstrated that in the presence of oxidative stress and the absence of a good anti-oxidant defence, free radicals oxidise the fats. Oxidised fats are dangerous for the health of the arteries. In this case it therefore be anything but beneficial to take fatty acids.

With reference to an omega-3 rich diet, **Dr. Barry Sears,** a biochemist at the MIT, has created a diet called **Zone**. As part of his nutritional project which could rather be defined a new lifestyle, Dr. Sears, believes that the administration of particularly purified omega-3 fatty acids may improve health in that these polyunsaturated fatty acids help to regulate and prevent inflammatory processes related to various diseases and to optimise the general state of psycho-physical health.

In the case of difficulty of interpreting the test results or in the presence of other medical conditions, consult a specialist able to provide tailored care.