

Dietary Fats

Fatty acid profile of erythrocytes



Fatty acids are molecules essential for life. In addition to being a source of energy, they have a fundamental role in the composition and functioning of the cellular membranes as well as in the synthesis of hormones.

There are four families of fatty acids and the balance in the consumption of different types is essential to preserving health.

Fatty acids and nutrition

The current western diet presents a clear imbalance in fatty acids, with an excess of saturated and trans fats and omega 6, and a deficit of omega 3. This increases the cardiovascular risk and generates a context of chronic inflammation, which in turn increases the cardiovascular risk (especially of sudden death), of cerebrovascular accident, of depression and of neurodegenerative illnesses, also having been involved in cancer.



The correction of the imbalance of fatty acids through the diet is a simple and very effective measure in the promotion of health.

Dietary Fats

The **Dietary Fats** analysis allows to know what kind of fats are consumed in the diet. The test assesses the fatty acids present in the cell membrane of erythrocytes and analyzed the following analytic parameters:

- Saturated fatty acids: myristic, palmitic and stearic acid
- Trans fatty acids: elaidic acid
- Monounsaturated fatty acids: palmitoleic and oleic acid
- Long chain fatty acids Omega6: linoleic (essential), arachidic, γ -linolenic and dihomo- γ -linolenic acid
- Long chain fatty acids Omega3: eicosapentaenoic (EPA), docosahexaenoic (DHA) and α -linolenic acid (essential)
- Index and ratios: Omega3 index (EPA+DHA), Omega6/Omega3 ratio and arachidonic/EPA ratio.

It is possible to request an advanced profile (ZONA-E) that incorporates to the **Dietary Fats** analysis analytic parameters related to the lipid metabolism:

- Glycated hemoglobin
- HDL cholesterol
- Total cholesterol
- Triglycerides/cHDL ratio
- Total cholesterol/cHDL ratio
- Triglycerides
- LDL cholesterol
- Insulin

The **Dietary Fats** analysis of erythrocytes is indicative of the fatty acids deposited on membranes, supplying information on the composition and functionality of the cellular membranes. The analysis reflects the consumption of fatty acids of the last three months, while the fatty acid profile of serum indicates the ingestion of fat in the last 7-10 days. The report of the results includes nutritional recommendations.

Indications

The evaluation of **Dietary Fats** may be made at any age (infancy, adolescence, adult and old age), and is specially indicated for:

- Persons who want to know the quality of the fats consumed in their usual diet
- Patients with inflammatory, immune or allergic illnesses
- Patients with cardiovascular disease (dyslipidemia, hypertension, metabolic syndrome, etc.)
- Patients with alterations in mood, humor or behavior or cognitive deficit
- Persons who want to proactively manage their health

It is advisable for the **Dietary Fats** analysis to be conducted once a year.

Requirements

12 hours of fasting.

Sample: **AGRE Profile:** 5 mL total blood in EDTA-K3 protected from light. Send refrigerated. **ZONA-E Profile:** 5 mL total blood in EDTA-K3 protected from light and 1 mL serum. Send refrigerated.

Documentation: General test requisition form.

A young woman with blonde hair is smiling and looking towards the camera while holding a burger. In the background, a man is partially visible, also smiling. The setting appears to be a restaurant or cafe with warm, blurred lighting. The image is split diagonally, with the top-left portion showing the woman and the bottom-right portion being white.

Are you eating
the right fats?

DIETARY **FATS**

Assessing the quality
of fats consumed in
your regular diet

Fatty acids and nutrition

Fatty acids are the basic components that make up the structure of the fats in the foods we eat. **During digestion, the body breaks down the fats in food into fatty acids** to be incorporated into both our fat tissue and our body's cell membranes.

Fat intake is often associated with being overweight or obese, **yet fatty acids are essential molecules for life**. In addition to being the main source of energy, they play a fundamental role in the composition and functionality of cell membranes, maintenance of body temperature, synthesis of hormones and immune mediators, support and protection of some organs, absorption and transport of fat-soluble vitamins (vitamin A, D, E, K), among other functions.

All immune mediators of inflammation come from dietary fats, so knowing the amounts, the type of fats consumed and how they are incorporated into our body is crucial in the context of inflammation and inflammation-associated diseases.

TYPES OF FATS AND WHERE TO FIND THEM



SATURATED

In foods of animal origin, pastry and bakery products



MONO-UNSATURATED

In nuts, avocado and some vegetable oils



POLY-UNSATURATED

In some vegetable oils, nuts, seafood, fish and shellfish



TRANS

In processed food

Currently, **the Western diet has a significant imbalance in the consumption of fatty acids**, which translates into a higher incidence of risk for cardiovascular disease, stroke, depression and neurodegenerative diseases, and has also been linked to the development of cancer.

CORRECTING FAT IMBALANCE
THROUGH DIET IS A SIMPLE AND
HIGHLY EFFECTIVE HEALTH-PROMOTING MEASURE

DIETARY **FATS** test

The DIETARY **FATS** test analyses the fatty acids present in the cell membrane of erythrocytes (red blood cells), which **allows us to know the type of fats that are regularly ingested in the diet, as well as their composition and function.** This makes it possible to detect possible deficiencies or imbalances in order to prevent the development of certain diseases through diet.

THE DIETARY **FATS TEST REFLECTS THE FATTY ACID INTAKE OF THE LAST 3-4 MONTHS,**
WHEREAS THE SERUM FATTY ACID TEST ONLY REFLECTS
THE INTAKE OVER THE LAST 7-10 DAYS

THE PARAMETERS ANALYSED ARE AS FOLLOWS:

SATURATED FATTY ACIDS (myristic, palmitic and stearic acids)

Excessive consumption of saturated fats has been associated with obesity and increased levels of LDL cholesterol, popularly known as **"bad" cholesterol, increasing the risk of developing cardiovascular disease.**

TRANS FATTY ACIDS (elaidic acid)

Trans fats, in addition to increasing LDL cholesterol levels, reduce HDL cholesterol ("good" cholesterol) in the blood, leading to an **increased risk of cardiovascular disease, obesity, type 2 diabetes or certain cancers.**



MONOUNSATURATED FATTY ACIDS (palmitoleic acid (omega-7) and oleic acid (omega-9))

The partial replacement of saturated fats by unsaturated fats (monounsaturated and polyunsaturated) has a beneficial effect on health, **contributing to the reduction of total and LDL cholesterol, an increase of HDL cholesterol** and thus to the prevention of these diseases.

LONG CHAIN FATTY ACIDS OMEGA-6 (linoleic acid (essential), arachidonic acid, gamma-linolenic acid and dihomo-gamma-linolenic acid)

They regulate **energy production, promote the growth and health of bones, skin and hair**, and intervene in the immune system to stop and repair cell damage. However, an excessive intake of omega-6s in proportion to omega-3s is associated with an increased risk of heart attack, stroke, joint inflammation, osteoporosis, mood changes (such as depression), obesity and cancer.

LONG CHAIN FATTY ACIDS OMEGA-3 (alpha-linolenic acid (essential), eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA))

Numerous studies show that a deficit of omega-3 fatty acids is associated with **increased cardiovascular risk, inflammation, neurocognitive impairment, vision loss** and even appears to be related to an **increased risk of diabetes and some types of cancer**. It has also been shown that there is an association between increased consumption of these fatty acids and a lower predisposition to diseases such as depression or attention deficit hyperactivity disorder (ADHD). **In pregnancy and lactation, they are essential for the proper development of the foetus and the growth of the newborn**, so the requirement is greater. In addition, adequate consumption during childhood helps to ensure proper cognitive function, as well as to prevent hypertension and obesity.

RATIOS AND INDICES (arachidonic/icosapentaenoic ratio (main marker of inflammatory status), omega-6/omega-3 and omega-3 index (EPA + DHA))

A diet balanced in omega-6 and omega-3 fatty acids is essential to **avoid alterations in blood coagulation and vascular tone**, as well as to promote a correct anti-inflammatory response and a healthy immune system in general. Through these ratios and indices it is determined whether there is an imbalance in the consumption of these fats, thus allowing us to make changes in our diet that are favourable to our health.

Is this test right for me?

The DIETARY **FATS** test can be performed at any age (childhood, adolescence, adulthood and old age) and is especially indicated for:

- People who want to know the **quality of the fats they ingest** in their regular diet
- People with **inflammatory, immune or allergic diseases**
- People with **cardiovascular diseases** (dyslipidemia, metabolic syndrome, hypertension, etc.)
- People with **mood or behavioural disorders** or cognitive deficits
- Individuals who wish to **proactively manage their health**

THE RESULTS INCLUDE PERSONALISED NUTRITIONAL
**RECOMMENDATIONS TO CORRECT ANY IMBALANCES
CAUSED BY THE DIET**

















You can also ask for the DIETARY **FATS+** test, which additionally includes the analysis of the following **parameters related to fat metabolism and inflammation**:

- Glycosylated haemoglobin
- LDL cholesterol
- Triglycerides/HDL-C ratio
- Triglycerides
- Total cholesterol
- Total cholesterol/ HDL-C ratio
- HDL cholesterol
- Insulin












PATIENT INFORMATION

FATTY ACIDS ERYTHROCYTES

		Results	Reference range	Units
SATURATED FATTY ACID				
Myristic (C14:0)		0,30	0,13 - 0,67	%
Palmitic (C16:0)		27	25 - 32,8	%
Stearic (C18:0)		20	17 - 21,45	%
TRANS FATTY ACID				
Elaidic (t-C18:1n9)		1	0,9 - 1,16	%
MONOUNSATURATED FATTY ACID				
Palmitoleic (C16:1n7)		0,2	0,1 - 0,3	%
Oleic (C18:1n9)		16	14,7 - 19,8	%
LONG-CHAIN OMEGA-6 POLYUNSATURATED FATTY ACIDS				
Linoleic (C18:2n6) Essential		10	8,6 - 13,2	%
Dihomo-Gamma-Linolenic (C20:3n6)		1	0,95 - 2	%
Arachidonic (C20:4n6)		13	10 - 16	%
Gamma-Linolenic (C18:3n6)		0,3	0,04 - 0,5	%
LONG-CHAIN OMEGA-3 POLYUNSATURATED FATTY ACIDS				
Alpha-Linolenic (C18:3n3)		0,10	0,04 - 0,16	%
Eicosapentaenoic (C20:5n3)		2	0,6 - 2,3	%
Docosahexaenoic (C22:6n3)		5,3	3,1 - 8,5	%
RATIOS				
Omega-3 Index		7,3	8 - 12	
Omega-6/Omega-3		3,28	2,7 - 6	
Stearic/Oleic		1,25	> 1,1	

FATTY ACIDS ERYTHROCYTES

		Results	Reference range	Units
INFLAMMATION. EICOSANOID PRECURSORS				
Omega-6/Omega-3		3,28	2,7 - 6	
Arachidonic (C20:4n6)		13	10 - 16	%
Arachidonic/Eicosapentaenoic		6,5	< 10	
Araquidonic/Dihomo-Gamma-Linolenic		13	5,5 - 13,1	
MEMBRANE FLUIDITY				
Saturated/Polyunsaturated		1,49 *	0,6 - 1	
Saturated %		47,3	45,5 - 51,4	%
Palmitoleic %		0,2	0,1 - 0,3	%
INSULIN DYNAMICS				
Linoleic/(Arachidonic+Dihommo-Gamma-L		0,71	0,4 - 0,8	
Saturated %		47,3	45,5 - 51,4	%