



Omega-3 DHA essence

NUTRI-lipidomics

Molecular nutrition and healthy diet



Omega-3 DHA: what is it?

DHA (docosahexaenoic acid), long-chain polyunsaturated fatty acid of the Omega-3 series, is a fundamental molecule, **component of the phospholipids of** various organs, including the **heart, brain and retina**. Phospholipids (molecules composed of fatty acids with different chemical structures) are the basic constituents of the cell membrane, a vital covering for all cells in the body.

Each organ, therefore each tissue, has its own membrane that contains a composition of fatty acids, the same in type but different in quantity, creating a real identity card, which allows its recognition but above all its adequate functionality of that organ [1].

How much DHA is to assume:

Since 2010, the European Safety Authority EFSA has established the daily requirement of DHA per individual by indicating 250 mg per day for an adult and underlining its importance in pregnancy, breastfeeding and at certain stages of life, such as during growth (EFSA Journal 2010 8 (3): 1461).

In 2014 (EFSA Journal 2014; 12 (10): 3840) the effect of DHA on "normal brain development" was verified, especially for infants and children under 2 years of age with dosages of 100 mg / day and with dosages of 250 mg / day for growth from 2 to 18 years.

Furthermore, scientific research and studies show that sporting activity increases the inflammatory tendency and consumes some polyunsaturated fatty acids and anti-inflammatory and protective activity for the nervous and cardiovascular system, including Omega-3 DHA [2-4].

Source of DHA:

Omega-3 DHA is found in algae or fish (which feeds on algae). In 100 grams of fish there can be up to 500 mg of omega-3 (EPA and DHA); therefore the usual consumption of fish is recommended (to learn more about the varieties of fish and their Omega-3 content >> <https://www.lipinutragen.it/en/fish-omega3-rich-food/>).

What benefits does DHA bring?

From **the metabolism of DHA**, which **occurs starting from the cell membrane**, lipid mediators with protective and anti-inflammatory effects come.

The following activities are scientifically proven and also approved by EFSA:

- **maintenance of normal brain function ***
- **maintenance of normal visual function ***

Together with the other omega-3 EPA, in dosages of at least 250 mg, DHA contributes to maintaining proper heart function (EU regulation 432/2012).

* the beneficial effect is obtained with a daily intake of 250 mg of DHA.

Why is it important to take DHA?

DHA can be formed in the human organism, through the enzymes, starting from its omega-3 precursor alpha-linolenic acid, essential fatty acid, which means that it must necessarily be introduced with food, since the human organism is not able to produce it independently. The transformation of alpha-linolenic acid into DHA requires many enzymatic steps (seven, to be precise) that may not work perfectly, for example due to a lack of cofactors, vitamins or even in some stages of life, including in aging; in these cases, DHA deficiencies may arise which must be appropriately rebalanced.

It is therefore important to know the level of DHA achieved in our cells, in order to be able to rebalance in case of deficiency and, given the low quantities obtainable with the diet, ask for advice on using supplements based on Omega-3 DHA.

“Smart integration” of DHA

Speaking of supplementation, there is one important thing to specify: the DHA supplement performs its task if, after taking, this fatty acid reaches the cell membrane, which is the natural place to carry out its activity. **It is precisely the membrane** (i.e. the envelope that surrounds the cells of all our tissues) **the target of polyunsaturated fatty acids**, including the precious DHA; it is reached through metabolic transformations, to then obtain important, indeed indispensable, biological effects. Therefore, the supplement must be formulated taking into account this metabolism

(which is called bioavailability in technical terms). Furthermore, knowing that degradation can occur in the distribution of polyunsaturated fats within the body, especially if the cells are under conditions of radical and oxidative stress, appropriate molecules with protective activity must be used in the formula of the supplement to preserve DHA.

To reassume:

Before assuming fatty acid food supplements, we must know that supplementing means compensating for a deficiency, a deficit that may depend on one's lifestyle and diet. To fill the deficiency, it is necessary to first understand IF it exists and **ESPECIALLY** check what type of deficiency is present in your body. In the context of Omega-3 fatty acids (but also omega-6), the analysis of the cell membrane comes handy, (technically called lipidomic analysis of cell membrane) – which photographs the condition of this envelope indispensable to the cell, and highlights the quality and quantity of integration, if necessary. The Omega-3, including DHA, are among the basic constituents of the cell membrane, without which cells cannot function properly. If exist a deficiency of DHA, traceable at the cell membrane level, it will also be controllable as to the effectiveness of the treatment, i.e. by comparing the results before and after integration.

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The information provided must in no way replace the direct relationship between health professional and patient.

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