ESSENTIAL FATTY ACIDS (INCL. TRANSFATTY ACIDS) IN BLOOD

Essential fatty acids belong to the category of essential nutrients, substances in food which are absolutely necessary for good health and which humans can’t synthetise from food.

Fatty acids serve as source of energy, they are important components of cell membranes and they are precursors to a special class of hormones, the eicosanoids (prostaglandins, thromboxanes and leukotrienes). The eicosanoids are a complex system of control molecules. Often various eicosanoids have opposing actions. For instance, prostaglandin E-1 (derived from gammalinolenic/linoleic acid) is anti-inflammatory and prostaglandin E-2 (derived from arachidonic acid) promotes inflammation. Because fatty acids function relative to each other, a balanced intake is crucial for good health (also, see the Figure on the next page). It can be seen that by modulating dietary precursors of the prostaglandins, inflammation may be reduced.

The essential fatty acids are all cis forms of fatty acids. The trans forms do not occur in nature, and are metabolic poisons. They are produced by manufacturing processes to harden oils.

THE TEST

The essential fatty acids are determined in the membranes of red blood cells, which gives a good indication of the essential fatty acid status over a long period. (Plasma values give information about the status at the time of sample collection).

The following essential fatty acids and fatty acid metabolites are determined (only as a panel)

<table>
<thead>
<tr>
<th>Omega -3 family</th>
<th>22:4 Docosatetraenoic (DTA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>18:3 Alpha-linolenic (ALA)</td>
<td>Omega-9 family</td>
</tr>
<tr>
<td>20:3 Eicosatrienoic</td>
<td>18:1 Trans Elaidic</td>
</tr>
<tr>
<td>20:5 Eicosapentaenoic (EPA)</td>
<td>18:1 Cis Oleic</td>
</tr>
<tr>
<td>22:6 Docosahexaenoic (DHA)</td>
<td>20:1 Eicosenoic</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Omega-6 family</th>
<th>22:1 Euricic</th>
</tr>
</thead>
<tbody>
<tr>
<td>18:2 Linoleic (LA)</td>
<td>24:1 Nervonic</td>
</tr>
<tr>
<td>18:3 Gammalinolenic (GLA)</td>
<td>Saturated:</td>
</tr>
<tr>
<td>20:2 Eicosadienoic (EDA)</td>
<td>16:0 Palmitic</td>
</tr>
<tr>
<td>20:3 Dihomogammalinolenic (DGLA)</td>
<td>18:0 Stearic</td>
</tr>
</tbody>
</table>

TEST INDICATIONS
- Allergy
- Arthritis
- Attention deficit
- Autoimmune disorders
- Bronchial asthma
- Cancer
- Eczema
- Heart disease
- Hypertension
- Premenstrual syndrome
- Psoriasis
- Skin disorders
- Ulcerative colitis/ulcers (duodenal / gastric)

COMPLEMENTARY TESTS
- Vitamins in blood
- Elements in blood or hair
- Stress test

LITERATURE
FIGURE: the conversion of omega-3 and omega-6 fatty acids to prostaglandins.

**OMEA-6 SERIE**

Vegetable products (esp. nuts, seeds and vegetable oil, like flaxseed)

Linoleic (LA)

Delta-6-desaturase

Gamma-linolenic (GLA)

Primerose oil

Borage oil

Dihomogamma-linolenic ( )

Arachidonic

PGE-1

**OMEA-3-SERIE**

Alpha-linolenic (ALA)

Eicosapentaenoic (EPA)

Docosahexaenoic (DHA)

Fish

Meat

**Update: 09-2007**