

Essential and Metabolic Fatty Acids Analysis (RBCs)



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Omega 3 Fatty Acids

Analyte	(cold water fish, flax, walnut)	Reference Range
α -Linolenic (ALA) 18:3 n3	<dl	≥ 0.09 wt %
Eicosapentaenoic (EPA) 20:5 n3	1.88	≥ 0.16 wt %
Docosapentaenoic (DPA) 22:5 n3	2.08	≥ 1.14 wt %
Docosahexaenoic (DHA) 22:6 n3	6.7	≥ 2.1 wt %
% Omega 3s	10.7	≥ 3.8

Omega 9 Fatty Acids

Analyte	(olive oil)	Reference Range
Oleic 18:1 n9	13	10-13 wt %
Nervonic 24:1 n9	2.8	2.1-3.5 wt %
% Omega 9s	15.7	13.3-16.6

Saturated Fatty Acids

Analyte	(meat, dairy, coconuts, palm oils)	Reference Range
Palmitic C16:0	20	18-23 wt %
Stearic C18:0	19	14-17 wt %
Arachidic C20:0	0.27	0.22-0.35 wt %
Behenic C22:0	0.88	0.92-1.68 wt %
Tricosanoic C23:0	0.14	0.12-0.18 wt %
Lignoceric C24:0	2.5	2.1-3.8 wt %
Pentadecanoic C15:0	0.09	0.07-0.15 wt %
Margaric C17:0	0.32	0.22-0.37 wt %
% Saturated Fats	43.0	39.8-43.6

Methodology: GCMS

Omega 6 Fatty Acids

Analyte	(vegetable oil, grains, most meats, dairy)	Reference Range
Linoleic (LA) 18:2 n6	10.6	10.5-16.9 wt %
γ -Linolenic (GLA) 18:3 n6	0.51	0.03-0.13 wt %
Dihomo- γ -linolenic (DGLA) 20:3 n6	2.02	≥ 1.19 wt %
Arachidonic (AA) 20:4 n6	15	15-21 wt %
Docosatetraenoic (DTA) 22:4 n6	1.27	1.50-4.20 wt %
Eicosadienoic 20:2 n6	0.18	≤ 0.26 wt %
% Omega 6s	29.2	30.5-39.7

Monounsaturated Fats

Omega 7 Fats	Reference Range
Palmitoleic 16:1 n7	0.23 ≤ 0.64 wt %
Vaccenic 18:1 n7	0.89 ≤ 1.13 wt %
Trans Fat	
Elaidic 18:1 n9t	0.26 ≤ 0.59 wt %

Delta - 6 Desaturase Activity

	Upregulated	Functional	Impaired	
Linoleic / DGLA 18:2 n6 / 20:3 n6	5.3			6.0-12.3

Cardiovascular Risk

Analyte	Reference Range
Omega 6s / Omega 3s	2.7 3.4-10.7
AA / EPA 20:4 n6 / 20:5 n3	8 12-125
Omega 3 Index	8.6 ≥ 4.0

The Essential Fatty Acid reference ranges are based on an adult population.

Essential Fatty Acid Metabolism

Omega 3 Family

α-Linolenic Acid

flax, walnut, grasses



Stearidonic acid

**Eicosatetraenoic acid,
ETA**

Eicosapentaenoic Acid

cold water fish



**Anti-inflammatory
Eicosanoids**

Docosapentaenoic Acid



Docosahexaenoic Acid

cold water fish



Omega 6 Family

Linoleic Acid

grains, vegetable oils

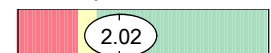


γ-Linolenic Acid

evening primrose, borage, black currant



Dihomo-γ-Linolenic Acid



**Series 1 Prostaglandins
Anti-inflammatory**

Arachidonic Acid

animal fats



**Pro-inflammatory
Eicosanoids**

Docosatetraenoic Acid



Delta-6 Desaturase

Vitamin and Mineral Cofactors:

FAD (B2), Niacin (B3)
Pyridoxal-5-phosphate (B6)
Vitamin C, Insulin, Zn, Mg

Elongase

Vitamin and Mineral Cofactors:

Niacin (B3)
Pyridoxal-5-phosphate (B6)
Pantothenic Acid (B5)
Biotin, Vitamin C

Delta-5 Desaturase

Vitamin and Mineral Cofactors:

FAD (B2), Niacin (B3)
Pyridoxal-5-phosphate (B6)
Vitamin C, Insulin, Zn, Mg

Elongase

Vitamin and Mineral Cofactors:

Niacin (B3)
Pyridoxal-5-phosphate (B6), Biotin
Pantothenic Acid (B5), Vitamin C

**Elongase
Delta-6 Desaturase**

Vitamin and Mineral Cofactors:

FAD (B2), Niacin (B3)
Pyridoxal-5-phosphate (B6), Biotin
Vitamin C, Zn, Mg, Carnitine
Pantothenic Acid (B5)

This test was developed and its performance characteristics determined by Genova Diagnostics, Inc. It has not been cleared by the U.S. Food and Drug Administration.