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**Lab Dept:** Chemistry

**Test Name:** FATTY ACID PROFILE, ESSENTIAL, SERUM

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***General Information***

**Lab Order Codes:** FAPR

**Synonyms:** C12-C22, Fatty Acid Profile, Essential; Essential Fatty Acids

**CPT Codes:** 82725 - Fatty Acids, nonesterified

**Test Includes:** See [Reference Range](#)

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***Logistics***

**Test indications:** Useful for evaluating the nutritional intake and intestinal absorption of essential fatty acids using serum specimens, identifying deficiency of essential and other nutritionally beneficial fatty acids, or monitoring treatment of patients with essential fatty acid deficiencies who are receiving linoleic acid (C18:2w6) and alpha-linolenic acid (C18:3w3).

**Lab Testing Sections:** Chemistry - Sendouts

**Referred to:** Mayo Clinic Laboratories (MML Test: FAPEP)

**Phone Numbers:** MIN Lab: 612-813-6280

STP Lab: 651-220-6550

**Test Availability:** Daily, 24 hours

**Turnaround Time:** 3-5 days, test performed Monday - Friday

**Special Instructions:** See [Patient Preparation](#)

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***Specimen***

**Specimen Type:** Blood

**Container:** SST (Gold, marble or red) tube

**Draw Volume:** 1.5 mL (Minimum: 0.5 mL) blood

**Processed Volume:** 0.5 mL (Minimum: 0.15 mL) serum

**Collection:** Routine blood collection

**Special Processing:** Lab Staff: Centrifuge specimen and aliquot serum into a plastic screw-capped round bottom vial. Store and ship at frozen temperatures. Forward promptly.

Serum specimen stable frozen (preferred) for 92 days, refrigerated for 72 hours.

**Patient Preparation:** Overnight (12-14 hour) fast recommended, see [Cautions](#) for further guidance on infants or persons suspected of having a fatty acid oxidation disorder. Patient must not consume any alcohol for 24 hours before the specimen is drawn.

**Sample Rejection:** Specimens other than serum; specimens held at incorrect temperature; gross lipemia.

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### ***Interpretive***

**Reference Range:**

<b>Fatty Acid nmol/mL</b>	<b>&lt;1 year</b>		<b>1 - 17 years</b>	<b>≥18 years</b>
Lauric Acid, C12:0	6 - 190		5 - 80	6 - 90
Myristic Acid, C14:0	30 - 320		40 - 290	30 - 450
Hexadecenoic Acid, C16:1w9	21 - 69		24 - 82	25 - 105
Palmitoleic Acid, C16:1w7	20 - 1020		100 - 670	110 - 1130
Palmitic Acid, C16:0	720 - 3120		960 - 3460	1480 - 3730
γ-Linolenic Acid, C18:3w6	6 - 110		9 - 130	16 - 150
α-Linolenic Acid, C18:3w3	10 - 190		20 - 120	50 - 130
Linoleic Acid, C18:2w6	1-31 days	32 days – 11 months	1 - 17 years	≥18 years
	350 - 2660	1000 - 3300	1600 - 3500	2270 - 3850

Oleic Acid, C18:1w9	250 - 3500	350 - 3500	650 - 3500
Vaccenic Acid, C18:1w7	140 - 720	320 - 900	280 - 740
Stearic Acid, C18:0	270 - 1140	280 - 1170	590 - 1170
EPA, C20:5w3	2 - 60	8 - 90	14 - 100
Arachidonic Acid, C20:4w6	110 - 1110	350 - 1030	520 - 1490
Mead Acid, C20:0:3w9	1 - 31 days	32 days – 11 months	≥1year
	8 - 60	3 - 24	7 - 30
h-γ-Linolenic Acid, C20:3w6	30 - 170	60 - 220	50 - 250
Arachidic Acid, C20:0	30 - 120	30 - 90	50 - 90
DHA, C22:6w3	10 - 220	30 - 160	30 - 250
DPA, C22:5w6	3 - 70	10 - 50	10 - 70
DPA, C22:5w3	6 - 110	30 - 270	20 - 210
DTA, C22:4w6	2 - 50	10 - 40	10 - 80
Docosenoic Acid, C22:1	2 - 20	4 - 13	4-13
Nervonic Acid, C24:1	30 - 150	50 - 130	60 - 100
<b>Triene Tetraene Ratio</b>	1 – 31 days	32 days – 17 years	≥18 years
	0.017 - 0.083	0.013 - 0.050	0.010 - 0.038
<b>Values below expressed as mmol/L</b>	<b>&lt;1 year</b>	<b>1 - 17 years</b>	<b>≥18 years</b>

Total Saturated Acid	1.2 - 4.6	1.4 - 4.9	2.5 - 5.5
Total Monounsaturated Acid	0.3 - 4.6	0.5 - 4.4	1.3 - 5.8
Total Polyunsaturated Acid	1.1 - 4.9	1.7 - 5.3	3.2 - 5.8
Total w3	0.0 - 0.4	0.1 - 0.5	0.2 - 0.5
Total w6	0.9 - 4.4	1.6 - 4.7	3.0 - 5.4
Total Fatty Acids	3.3 - 14.0	4.4 - 14.3	7.3 - 16.8

**Critical Values:** N/A

**Limitations:** For nutritional assessment, a 12- to 14-hour fast is required; however, patients suspected of having a fatty acid oxidation disorder should not fast before testing due to the possibility of acute metabolic decompensation. Instead, collect the specimen after the longest fast possible, just before feeding. In the case of a patient on total parenteral nutrition, specimen can be collected as normal.

**Methodology:** Capillary gas chromatography/Mass spectrometry, Stable isotope dilution.

**References:** [Mayo Clinic Laboratories](#) August 2023

**Updates:** 8/23/2023: Initial entry