

LAB No:

Consulting Pathologist: **Dr D. Deam**

Patient :  
D.O.B. :  
Request Date :  
Date Received :  
Requested by :  
Referring Practice :  
Provider No. :  
REFERRING PRACTICE REFERENCE:

## ESSENTIAL FATTY ACIDS - RED CELL

### SUMMARY OF ESSENTIAL FATTY ACID RESULT

|                       | Within Ref. Range | Outside Ref. Range | Reference Range |
|-----------------------|-------------------|--------------------|-----------------|
| TOTAL SATURATED       |                   | 48.1               | 19.3 - 39.4 %   |
| TOTAL MONOUNSATURATED |                   | 18.0               | 7.5 - 17.9 %    |
| TOTAL n3              | 9.1               |                    | 4.5 - 13.4 %    |
| TOTAL n6              | 24.8              |                    | 12.1 - 29.2 %   |
| RATIO n3/n6           |                   | 0.36               | 0.37 - 0.46     |
| RATIO Red Cell AA/EPA | 4.70              |                    |                 |

#### Saturated Fats

|                        |     |      |              |
|------------------------|-----|------|--------------|
| MYRISTIC ACID [C14:0]  | 0.5 |      | 0.0 - 0.7 %  |
| PALMITIC ACID [C16:0]  |     | 31.1 | 9.3 - 21.7 % |
| STEARIC ACID [C18:0]   |     | 16.3 | 9.3 - 13.7 % |
| ARACHIDIC ACID [C20:0] | 0.1 |      | 0.1 - 0.5 %  |
| BEHENIC ACID [C22:0]   |     | 0.1  | 0.6 - 2.8 %  |

#### Monounsaturated Fats

|                             |     |      |              |
|-----------------------------|-----|------|--------------|
| PALMITOLEIC ACID [C16:1n7]  | 0.2 |      | 0.0 - 0.4 %  |
| cis VACCENIC ACID [C18:1n7] | 1.3 |      | 0.0 - 1.6 %  |
| OLEIC ACID [C18:1n9]        |     | 16.3 | 7.5 - 15.5 % |
| GONDOIC ACID [C20:1n9]      | 0.2 |      | 0.0 - 0.4 %  |

#### n6

|                                |      |  |              |
|--------------------------------|------|--|--------------|
| LINOLEIC ACID [C18:2n6]        | 11.2 |  | 5.0 - 12.4 % |
| gamma LINOLENIC ACID [C18:3n6] | 0.1  |  | 0.0 - 0.1 %  |
| EICOSADIENOIC ACID [C20:2n6]   | 0.2  |  | 0.0 - 0.2 %  |
| EICOSATRIENOIC ACID [C20:3n6]  | 1.3  |  | 0.9 - 2.8 %  |
| ARACHIDONIC ACID [C20:4n6]     | 12.1 |  | 6.2 - 13.7 % |

#### n3

|                                 |     |     |             |
|---------------------------------|-----|-----|-------------|
| alpha LINOLENIC ACID [C18:3n3]  | 0.1 |     | 0.1 - 0.2 % |
| EICOSAPENTAENOIC ACID [C20:5n3] |     | 2.5 | 0.1 - 1.2 % |
| DOCOSAPENTAENOIC ACID [C22:5n3] | 2.4 |     | 1.9 - 4.7 % |
| DOCOSAHEXAENOIC ACID [C22:6n3]  | 4.0 |     | 2.5 - 7.5 % |

### RESULTS LEGEND

**NAA** = Not Able to Assay

**N/A** = Not Applicable

**NG** = Not Given

**ND** = Not Detected

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## ESSENTIAL FATTY ACIDS - RED CELL

### COMMENT

NOTE: The reference values quoted, were derived from U.S.A. populations.  
The fatty acids were extracted from saline washed packed red cells, esterified and analysed by capillary gas chromatography with flame ionization detection.  
**ANALYSIS** : Individual Red Cell Fatty Acids are reported as relative percent of the total Red Cell Fatty Acids.  
**REFERENCE RANGE** : The reference ranges were established on blood samples collected from the antecubital vein of healthy adult subjects the morning after an overnight fast.  
The samples were collected in lithium heparin tubes, seperated immediately and stored frozen prior to analysis.  
Samples submitted for analysis should be collected as described above.

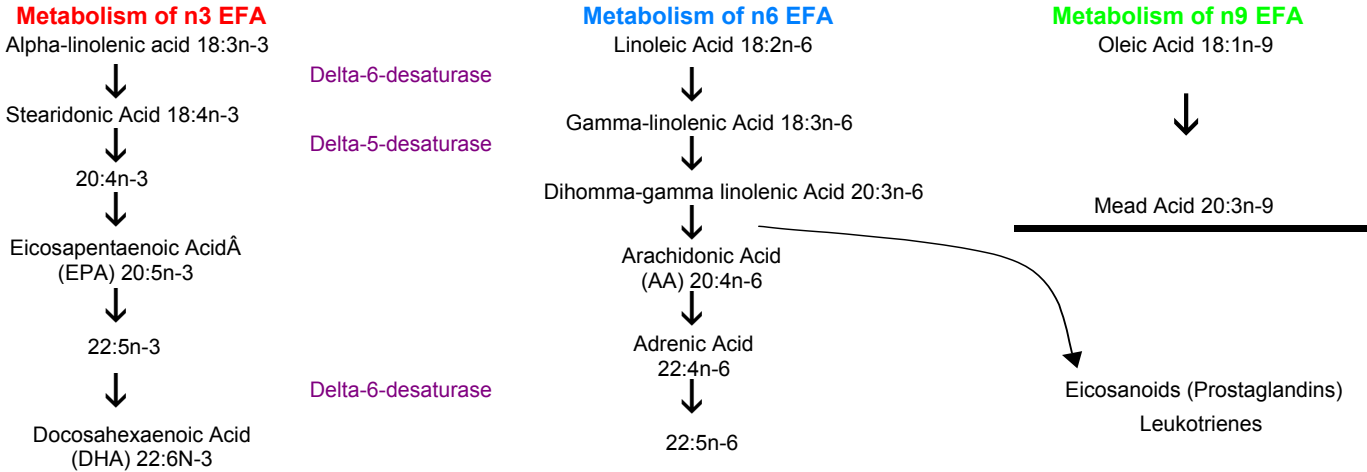
Tests ordered: RC/FA

FINAL REPORT on 12 Jul 2011 16:09

# ESSENTIAL FATTY ACIDS

## Interpretive Guide

Essential Fatty Acids (EFAs) are unsaturated fatty acids that are regarded as essential for human life. Below are the pathways for EFA metabolism and dietary sources.



**Essential Nutrients for EFA Metabolism** Magnesium, Zinc, Selenium, Biotin, Vitamin B5, Vitamin B6 and Vitamin E

## Saturated Fats

### Arachidic Acid

#### Sources (mg/100 gms)

|                               |
|-------------------------------|
| Butter                        |
| Peanut Oil (3000 mg)          |
| Pumpkin Seed Oil (500 mg)     |
| Evening Primrose Oil (300 mg) |
| Wheat Germ Oil (190 mg)       |

### Behenic Acid

- Poorly absorbed in human body.
- Increases total serum cholesterol and LDL cholesterol.

#### Sources (mg/100 gms)

|                               |
|-------------------------------|
| Jobba Oil (200 mg)            |
| Wheat Germ Oil (130 mg)       |
| Evening Primrose Oil (100 mg) |

### Palmitic Acid

#### Sources (mg/100 gms)

|                           |
|---------------------------|
| Butter (21334 mg)         |
| Avocado Oil (14000 mg)    |
| Wheat Germ Oil (12500 mg) |
| Olive Oil (11000 mg)      |
| Pumpkin Oil (10600 mg)    |

### Myristic Acid

- Increases total serum cholesterol and LDL cholesterol

#### Sources (mg/100 gms)

|                         |
|-------------------------|
| Coconut Oil (16000 mg)  |
| Butter (8157 mg)        |
| Macadamia Oil (1100 mg) |

### Stearic Acid

- Converted to Oleic Acid (by delta-9 desaturase)
- Component of phospholipids
- May actually lower serum cholesterol

#### Sources (mg/100 gms)

|                            |
|----------------------------|
| Jobba Oil (10100 mg)       |
| Butter (9800 mg)           |
| Chocolate (8500 mg)        |
| Pumpkin Seed Oil (6100 mg) |
| Sesame Seed Oil (5000 mg)  |
| Sunflower Oil (4200 mg)    |
| Soybean Oil (4100 mg)      |
| Macadamia Oil (3000 mg)    |
| Olive Oil (2700 mg)        |
| Lamb (1200 mg)             |
| Beef (1200 mg)             |
| Pork (1200 mg)             |

## Monounsaturated Fats

### Gondoic Acid

| Sources          |  |
|------------------|--|
| Grape Seed Oil   |  |
| Mustard Seed Oil |  |
| Atlantic Cod     |  |

### Palmitoleic Acid

- Converts to Palmitic Acid by delta-9 desaturase
- Content of skin's sebum content

| Sources (% of Palmitoleic Acid) |                             |
|---------------------------------|-----------------------------|
| Cows Milk                       | Macadamia Oil (21.5%)       |
| Avocado Oil (5.5%)              | Evening Primrose Oil (6.1%) |

### Oleic Acid

- Component of phospholipids
- Converted to Stearic Acid by delta-9 desaturase

| Sources (mg/100 gms)       |                             |
|----------------------------|-----------------------------|
| Olive Oil (75000 mg)       | Almond Oil (64600 mg)       |
| Canola Oil (59000 mg)      | Macadamia Oil (57000 mg)    |
| Eggs (43000 mg)            | Pumpkin Seed Oil (41400 mg) |
| Sesame Seed Oil (40000 mg) | Butter (30000 mg)           |
| Walnut Oil (21000 mg)      | Chocolate (9590 mg)         |

### Vaccenic Acid

- Converts to Palmitoleic Acid

| Sources |  |
|---------|--|
| Butter  |  |

## Omega 6

### Arachidonic Acid

- Component of Cell Membranes

| Functions   |  |
|---|--|
| Precursor to series 2 prostaglandins (prostaglandin E2) |  |
| Precursor to the production of series 2 thromboxanes    |  |
| Precursor to the production of series 4 leukotrienes    |  |

| Inhibited by                   |  |
|--------------------------------|--|
| Conjugated Linoleic Acid (CLA) |  |
| Alpha Linolenic Acid (ALA)     |  |
| Docosahexaenoic Acid (DHA)     |  |
| Eicosapentaenoic Acid (EPA)    |  |
| Prostaglandin E1 (PGE1)        |  |
| Prostaglandin E3 (PGE3)        |  |
| Vitamin E                      |  |

| Sources |        |
|---------|--------|
| Eggs    | Beef   |
| Kidneys | Prawns |

### Linoleic Acid

| Sources              |  |
|----------------------|--|
| Rice Bran            |  |
| Sesame Oil           |  |
| Peanut Oil           |  |
| Canola Oil           |  |
| Corn Oil             |  |
| Sunflower Oil        |  |
| Evening Primrose Oil |  |

### Eicosatrienoic Acid (Mead Acid)

- Lowers serum triglycerides
- Inhibits Lipoxygenase
- Converts to Stearidonic Acid by elongase
- Enriched in connective tissue
- Accumulates in conditions of EFA deficiency

| Sources              |           |
|----------------------|-----------|
| Green Lipped Mussels | Fish Oils |

## Omega 3

### Eicosapentaenoic Acid

- Concentrates in Cell Membranes

| Functions                 |  |
|---------------------------|--|
| Anti-hypertensive         |  |
| Anti-inflammatory         |  |
| Reduces LDL Cholesterol   |  |
| Increases HDL Cholesterol |  |

| Sources (mg/100gms) |  |
|---------------------|--|
| Trout               |  |

### Docosahexaenoic Acid

| Functions                 |  |
|---------------------------|--|
| Anti-arrythmia            |  |
| Anti-hypertensive         |  |
| Improves retina function  |  |
| Increases HDL Cholesterol |  |
| Lowers LDL Cholesterol    |  |
| Anti-inflammatory         |  |
| Improves mental function  |  |

| Sources (mg/100gms)      |                  |
|--------------------------|------------------|
| Cod Liver Oil (10968 mg) | Salmon (5900 mg) |
| Mackerel (1500 mg)       | Trout (600 mg)   |
| Sardines (600 mg)        |                  |

### Docosapentaenoic Acid

| Sources (mg/100gms)  |  |
|----------------------|--|
| Salmon Oil (3600 mg) |  |

### Alpha Linolenic Acid

- Damaged by heat

| Functions                       |  |
|---------------------------------|--|
| Anti-inflammatory               |  |
| Reduces serum cholesterol       |  |
| Metabolises oxygen in the body  |  |
| Essential for brain development |  |
| Improves co-ordination          |  |

| Enhanced by          |  |
|----------------------|--|
| Delta-6 desaturase   |  |
| Magnesium, Zinc      |  |
| Vitamin B3, B6 and C |  |

| Sources (mg/100gms)       |  |
|---------------------------|--|
| Flax seed Oil (550000 mg) |  |
| Canola Oil (10000 mg)     |  |
| Hemp Seed Oil (19000 mg)  |  |
| Trout (600 mg)            |  |
| Walnut (3000 mg)          |  |



