Metabolism and functional effects of plant-derived omega-3 fatty acids in humans

Article

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\[ \text{H}_2\text{C} - \text{COOH} \]

**α-Linolenic acid (ALA; 18:3n-3)**

\[ \Delta_6\text{-desaturase (Fads2)} \]

\[ \text{H}_2\text{C} - \text{COOH} \]

**Stearidonic acid (SDA; 18:4n-3)**

\[ \text{Elongase (Elov15)} \]

\[ \text{H}_2\text{C} - \text{COOH} \]

**Eicosatetraenoic acid (ETA; 20:4n-3)**

\[ \Delta_5\text{-desaturase (Fads1)} \]

\[ \text{H}_2\text{C} - \text{COOH} \]

**Eicosapentaenoic acid (EPA; 20:5n-3)**

\[ \text{Elongase (Elov12 or 5)} \]

\[ \text{H}_2\text{C} - \text{COOH} \]

**Docosapentaenoic acid (DPA; 22:5n-3)**

\[ \text{Elongase (Elov12)} \]

\[ \text{H}_2\text{C} - \text{COOH} \]

**Tetracosapentaenoic acid (24:5n-3)**

\[ \Delta_6\text{-desaturase (Fads2)} \]

\[ \text{H}_2\text{C} - \text{COOH} \]

**Tetracosahexaenoic acid (24:6n-3)**

\[ \text{Peroxisomal \ β-oxidation} \]

\[ \text{H}_2\text{C} - \text{COOH} \]

**Docosahexaenoic acid (DHA; 22:6n-3)**

Figure 1
**α-Linolenic acid**

- **β-Oxidation**
  - Acetyl-CoA
  - Krebs cycle
  - CO$_2$

- **Fatty acid synthesis**
  - Saturated and monounsaturated fatty acids

- **Desaturation and elongation**
  - EPA
  - DPA
  - DHA

- **Cell membranes**

- **Storage**
Figure 3

A) 6% of total fatty acids

B) 6% of total fatty acids

Weeks

% of total fatty acids

EPA
DPA
DHA
Figure 5

A) B)

Change in EPA (%)

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<th></th>
<th>ALA</th>
<th>SDA</th>
<th>EPA</th>
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<tr>
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<td>0</td>
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<tr>
<td>B</td>
<td>0</td>
<td>50</td>
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