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## Enhanced increase of omega-3 index in response to long-term n-3 fatty acid supplementation from triacylglycerides versus ethyl esters

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### Abstract

#### Background:

**There is a debate currently about whether different chemical forms of eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) are absorbed in an identical way. The objective of this study was to investigate the response of the omega-3 index, the percentage of EPA+DHA in red blood cell membranes, to supplementation with two different omega-3 fatty acid (n-3 FA) formulations in humans.**

#### Design:

**The study was conducted as a double-blinded placebo-controlled trial. A total of 150 volunteers was randomly assigned to one of the three groups: (1) fish oil concentrate with EPA+DHA (1.01 g+0.67 g) given as reesterified triacylglycerides (rTAG group); (2) corn oil (placebo group) or (3) fish oil concentrate with EPA+DHA (1.01 g+0.67 g) given as ethyl ester (EE group). Volunteers consumed four gelatine-coated soft capsules daily over a period of six months. The omega-3 index was determined at baseline ( $t_0$ ) after three months ( $t_3$ ) and at the end of the intervention period ( $t_6$ ).**

#### Results:

**The omega-3 index increased significantly in both groups treated with n-3 FAs from baseline to  $t_3$  and  $t_6$  ( $P < 0.001$ ). The omega-3 index increased to a greater extent in the rTAG group than in the EE group ( $t_3$ : 186 versus 161% ( $P < 0.001$ );  $t_6$ : 197 versus 171% ( $P < 0.01$ )).**

**Conclusion:**

**A six-month supplementation of identical doses of EPA+DHA led to a faster and higher increase in the omega-3 index when consumed as triacylglycerides than when consumed as ethyl esters.**