

Dietary eicosapentaenoic acid and docosahexaenoic acid equally incorporate as decosahexaenoic acid but differ in inflammatory effects.

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OBJECTIVE: The omega-3 polyunsaturated fatty acids are involved in the modulation of the immune response. Docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA) produced from dietary precursors may not be sufficient to match nutritional requirements and thus should be included in our diet. In this sense, the administration of higher amounts of DHA than of EPA in infant formulations is recommended. The aims of this work were to demonstrate that dietary administration of EPA or DHA to mice allows reaching similar tissue DHA levels and to compare their anti-inflammatory effects and mechanisms of action.

METHODS: Balb/c mice were fed diets enriched with EPA or DHA for 3 wk. Twelve hours before sacrifice, a contact dermatitis was induced in the ears of the animals. Tissue fatty acid contents were determined. Cytokine and immunoglobulin concentrations were measured by enzyme-linked immunosorbent assay, and ears were collected to analyze local inflammatory effects. **RESULTS:** The DHA concentrations attained in tissues were similar to the two diets, whereas the EPA concentration increased only when the diet was enriched with this polyunsaturated fatty acid. Although EPA and DHA reduced ear inflammation, EPA reduced neutrophil infiltration in the ears more efficiently. EPA was associated with a greater reduction in the systemic macrophage inflammatory response and T-helper type 2 response and with increased interleukin-10 production. **CONCLUSION:** Similar levels of DHA in tissues are reached in mice fed an EPA- or a DHA-enriched diet. Dietary EPA and DHA show anti-inflammatory properties, but EPA appears to be more potent.