

# Omega 3 fatty acid

Omega-3 [fatty acids](#) (also called  $\omega$ -3 fatty acids or n-3 fatty acids) are polyunsaturated fatty acids with a double bond (C=C) at the third carbon atom from the end of the carbon chain.

The fatty acids have two ends, the carboxylic acid (-COOH) end, which is considered the beginning of the chain, thus "alpha", and the methyl (CH<sub>3</sub>) end, which is considered the "tail" of the chain, thus "omega." The nomenclature of the fatty acid is taken from the location of the first double bond, counted from the methyl end, that is, the omega ( $\omega$ -) or the n- end.

It is well-recognized that n-3FA are important for proper [neurodevelopment](#) and function <sup>1) 2)</sup>.

Western dietary intakes result in a deficiency of n-3FA and an over-dominant intake of proinflammatory omega-6s (n-6FA). The ratio of n-3:n-6FA in the Western diet can be as low as 1:50. Such imbalance is reflected directly in the composition of neuron membrane phospholipids favoring inflammatory processes <sup>3)</sup>.

N-3FA attenuate release of these proinflammatory cytokines, decrease COX activity, inhibit formation of proinflammatory eicosanoids and cytokines, and promote levels of anti-inflammatory decosanoids <sup>4) 5)</sup>.

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Long-term O3FA dietary supplementation prevents the development of intracranial [atherosclerosis](#). This O3FA effect appears to be mediated by its prevention of macrophage infiltration into the vessel wall, therefore reducing inflammation and intimal thickening. While similar effects in humans need to be determined, O3FA dietary supplement shows promising results in the prevention of ICAS <sup>6)</sup>.

## Sepsis

Omega-3 nutritional supplementation may reduce [ICU](#) length of stay and duration of mechanical ventilation without significantly affecting mortality, but the very low quality of overall evidence is insufficient to justify the routine use of omega-3 fatty acids in the management of sepsis <sup>7)</sup>.

<sup>1)</sup>

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<sup>2)</sup>

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<sup>3)</sup>

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<sup>4)</sup>

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<sup>5)</sup>

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<sup>6)</sup>

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<sup>7)</sup>

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