

Stearidonic acid as a supplemental source of ω -3 polyunsaturated fatty acids to enhance status for improved human health.

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Abstract

There is substantial evidence to show that consumption and increased blood levels of the very long-chain (VLC) ω -3 polyunsaturated fatty acids (ω -3 PUFAs) eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) are associated with health benefits. The consumption of oily fish is an effective way of increasing EPA and DHA intake and status, but intake in most Western countries remains below the levels recommended for optimal health. The reasons for this include not liking the taste, a concern about sustainability of fish supplies, or potential chemical and heavy metal contamination. Alternative dietary sources of ω -3 fatty acids to enhance EPA and DHA status in the body would therefore be beneficial. There are many non-fish food sources of the essential plant-derived ω -3 fatty acid α -linolenic acid, but conversion from this to longer-chain EPA and especially to DHA is poor. Stearidonic acid (SDA) is an intermediate fatty acid in the biosynthetic pathway from α -linolenic acid to VLC ω -3 PUFAs and the conversion from SDA is more efficient than from α -linolenic acid. However, there are few food sources rich in SDA. Oil crops naturally rich in SDA or enriched through genetic modification may offer an alternative supplemental oil to boost the population status of VLC ω -3 PUFAs. This review discusses the currently available evidence that increased SDA consumption can increase red blood cell EPA content, although this is less than the effect of supplementation directly with EPA. There is now a need for trials specifically designed to assess whether an increased SDA consumption would translate into improved human health outcomes.

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