

Do strict vegetarians suffer any consequences of omega-3 PUFA deficiency?

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Considerable epidemiological evidence indicates that vegetarians and particularly vegans have levels of morbidity and mortality from cancers and cardiovascular diseases lower than omnivores. The general consensus being that lifestyle and dietary factors (low saturated fat/high fibre) are responsible for this health advantage. However in studying vegan subjects we have found an unusually high tissue ratio of n-6 : n-3 long chain polyunsaturated fatty acids (LCP). In previous dietary studies with omnivores, we have found that raising the tissue n-6 : n-3 LCP ratio resulted in an increased production of the platelet aggregating eicosanoid, thromboxane (1). Vegan subjects also exhibited increased thromboxane production and elevated platelet reactivity, relative to omnivore controls, a situation indicative of increased thrombosis potential.

The tissue imbalance of LCP in vegans is due to the relatively high dietary intake of linoleic acid (18:2 n-6), moderate α -linolenic acid (18:3 n-3) intake and total lack of dietary LCP, such as eicosapentaenoic acid (20:5 n-3) and docosahexaenoic acid (22:6 n-3). Of particular concern is the evidence that infant brain function and visual acuity are negatively affected by insufficient supply of n-3 LCP during pregnancy and breast feeding (2). Vegan mothers produce milk with approximately one third the 22:6 n-3 level of omnivores, resulting in significantly lower 22:6 n-3 levels in erythrocyte lipids of the infants (3). Also quite recently, a number of reports have been published linking faulty fatty acid metabolism, particularly n-3 LCP with depression and schizophrenia (4), which has been shown to partially respond to supplementation with n-3 LCP (5). No evidence is available to suggest that vegans suffer higher levels of thrombotic events, schizophrenia or general lack of visual function. However studies are needed to clarify these links and determine if vegan diets would benefit from a shift in the current n-6 : n-3 LCP intake ratio. Or conversely, if this LCP imbalance is not manifested in physiologically significant sequela, what protective mechanisms are operating in vegans?

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