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**PRODUCT PRECURSOR RATIOS DECREASE WITH INCREASED LEVELS OF ALPHA-LINOLENIC ACID.**

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Increased levels of  $\Omega$ -3 eicosanoids lower ischemic heart disease risk. Diets high in  $\alpha$ -linolenic acid [LNA] increase production of eicosapentaenoic acid [EPA(n-3)] and docosahexaenoic acid [DHA(n-3)]. Walnuts are one of few common foods high in LNA (10% of total energy). We previously reported that a walnut-rich diet (20% of energy) increased concentrations of  $\Omega$ -3 fatty acids, lowered serum cholesterol, and improved serum lipoprotein profile. We now report the product precursor ratios of LNA, EPA, and DHA. In a strictly controlled experiment, we fed 18 men two mixed natural diets each for a four week period, in random order. Compared to the control, the walnut diet increased levels of linoleic acid (LA) by 6%, LNA by 120%, and EPA by 23%, while DHA decreased by 30% in cholesterol esters. The product precursor ratio EPA/LNA decreased from 0.79 in the control to 0.44 in the walnut diet ( $p < 0.001$ ). The DHA/LNA ratio dropped from 1.59 in control to 0.51 in walnut ( $p < 0.001$ ). The (EPA+DHA)/LNA ratio decreased from 2.08 in the control to 0.90 in the walnut diet ( $p < 0.001$ ). We conclude that although the  $\Omega$ -3 fatty acid-rich walnut diet increases LNA and EPA in cholesterol esters, it reduces product precursor ratios. These findings suggest limitations on tissue metabolism due to competition for elongase and desaturase enzymes by elevated  $\Omega$ -6 fatty acids in walnuts, or insufficient levels of LNA or EPA.