Omega-3 and Trans Fatty Acid Interactions

For those who do not consume preformed DHA from dietary sources, concern has been expressed about the potential inhibitory effect of high trans fatty acid (TFA) intakes in the diet relative to ALA and the potential for an even more compromised conversion efficiency from ALA to DHA. This concern is based on extensive literature indicating that high trans intakes in experimental animals partially inhibit the desaturation reactions involved in the conversion of ALA to EPA and subsequently to DHA. For example, a typical Canadian diet contains an approximate TFA: ALA (omega-3) ratio of 6:1 which is similar to the ratio found in Canadian breast milk. An inverse correlation has been reported by Elias and Innis (2001) between the TFA status of infants and their DHA concentrations in the circulation suggesting possible interfering effects of TFAs on fetal growth and length of gestation. Other studies have reported that TFA can inhibit the conversion of ALA to the longer-chain omega-3 products thereby reducing the availability of DHA plus EPA in arterial cells and potentially enhancing the development of coronary heart disease.

Thus, reducing the dietary intake of TFA is an important health goal. The potentially adverse interactive effects of TFA on omega-3 fatty acid metabolism and generation of DHA/EPA is yet another valid reason for greatly reducing our current high intakes of TFA in North America and other countries.

