Secular trends in trans fatty acids: decreased trans fatty acids in the food supply are reflected in decreased trans fatty acids in plasma1,2

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The adverse effects of trans fatty acids (TFAs) have been well documented in the scientific literature. TFAs have adverse effects on lipids, inflammatory markers, endothelial function, and insulin sensitivity, all of which translate into an increased risk of cardiometabolic disease (1). For this reason, governments have formulated and implemented food regulations to decrease the content of TFAs in the food supply. Although regulations vary by country, the global trend of trans fat content shows a decrease. Published evidence shows that foods formerly high in TFAs either no longer contain them or have decreased their amount substantially.

It might seem obvious that a decrease in TFAs in the food supply would be reflected in a corresponding decrease in TFA intake in the population, but surprisingly, few published studies document this trend. One of these studies, in this issue of the Journal, by Schwenke et al (2) shows how TFA intake, as measured with plasma biomarkers, has significantly decreased in the period 2002–2004, concurrent with the beginning of the decrease in TFAs in the food supply in the United States. On the other hand, amounts of other fatty acids, specifically PUFAs, MUFAs, and SFAs, have not changed significantly. Although this study focused on a selected population of patients with type 2 diabetes, its results are nevertheless relevant because this population is at higher risk of cardiovascular disease and presumably may be more susceptible to the deleterious effects of TFAs.

The authors recognized certain limitations in their results, especially a cross-sectional design and a selected study population that cannot be generalized to the whole population. The sample size was also relatively small. However, the study has several strengths that should be emphasized. First, because of marked changes in TFAs in the food supply, it is difficult to estimate trends by analyzing dietary data solely from food questionnaires. Therefore, the use of plasma biomarkers to measure TFA intake is a clear advantage of this study, because biomarkers are objective and not subject to recall bias. Finally, by analyzing fatty acids as concentrations instead of as a percentage of total fat acids, Schwenke et al allow for the evaluation of absolute changes that are unaffected by changes in other fatty acids. On the other hand, plasma fatty acids represent short-term intake, whereas long-term intake is best represented by other tissues, such as adipose tissue. Adipose tissue may also more accurately capture the cumulative effect of TFAs, because we know little about the fate of TFAs that populations have consumed in the past.

An important point highlighted by the authors is that TFAs should decrease at the expense of SFAs but not of PUFAs, but this pattern is not necessarily what food industry companies are implementing in their new products (3). Schwenke et al showed that there is no significant change in the other fats. In a way, the lack of significant change is encouraging because if we want to see improvements in health outcomes, TFAs, which are harmful, should not be reduced at the expense of PUFAs, which are healthful. A favorable trend in lipids in the US population has been observed during the past decade, with a decrease in LDL cholesterol and an increase in HDL cholesterol (4, 5). Although we cannot claim that a causal link exists between this improved cholesterol profile and the reduction in TFAs, the overall decrease in TFAs could possibly explain the improvement in cholesterol concentrations. A recent study estimated that stricter food regulations and recommendations in the United Kingdom aimed at eliminating industrial trans fats, reducing saturated fats and salt, and increasing fruit and vegetable intake would result in 30,000 fewer deaths per year than if current trends continue, which would lead to an estimated 12,500 preventable deaths per year (6). Although these figures represent only estimates, they nevertheless suggest the impact that different food regulations can make on populations, all of whom deserve a world free of junk food (6). Finally, Schwenke et al emphasize that further research is needed to evaluate how trends in TFAs will translate into changes in cardiovascular risk. We will find the answer by carefully monitoring changes in the fatty acid content of the food supply and changes in cardiometabolic risk at the population level.

The author had no conflicts of interest.

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First published online February 27, 2013; doi: 10.3945/ajcn.113.058321.
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