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## **Summaries of some of the studies on the harmful effects of trans fats**

Links to the following studies can be found in the "studies" section on the About Trans Fats page of the BanTransFats.com website.

1. A major comprehensive study on the health effects of trans fats was published in April 2006 in the New England Journal of Medicine. The study brings together the findings from different studies and trials and contains several findings, including the following:

On a per-calorie basis, trans fats appear to increase the risk of coronary heart disease more than any other macronutrient, conferring a substantially increased risk at low levels of consumption (1 to 3 percent of total energy intake). In a meta-analysis of four prospective cohort studies involving nearly 140,000 subjects, including updated analyses from the two largest studies, a 2 percent increase in energy intake from trans fatty acids was associated with a 23 percent increase in the incidence of coronary heart disease....

2. In a study in the Netherlands, scientists randomly assigned 29 healthy men and women to a diet high in trans fat, or a high saturated fat diet in which the trans fat was replaced by saturated fats. The trans fat came mostly from partially hydrogenated soybean oil and the saturated fat came from palm kernel oil. After four weeks on one diet, the subjects were crossed over to the other diet. For each subject, the researchers took four measurements of artery dilation in the arm. They found that the ability of the blood vessels to dilate was 29 percent lower in people who ate the high trans fat diet compared to those on the saturated fat diet. Blood levels of HDL (good) cholesterol were 21 percent lower in the high trans fat group compared to the high saturated fat group.

3. In a study in Australia, scientists acquired dietary information as well as fat biopsy samples from 79 people. Each had just had a first heart attack. The researchers obtained similar information and biopsy samples from 167 people without heart problems. The researchers inquired specifically about the participants' type and amount of fat intake. The heart patients and healthy individuals were also matched for age, gender, and socioeconomic background. Analysis revealed that trans fats from both animal and vegetable sources were significantly more abundant in the fat tissues of heart attack patients than in the healthy volunteers. The relationship of abundant trans fats with heart risk remained even after the scientists statistically accounted for the effect of saturated fats in the participants' diets.

4. In a study in Seattle, 179 cases aged 25 to 74 were out-of-hospital cardiac arrest patients attended by paramedics in Seattle from 1988 to 1999. 285 controls, matched to the 179 cases by age and sex, were randomly identified from the community. Participants were free of previous clinically diagnosed heart disease. Blood was obtained at the time of cardiac arrest (cases) or at the time of an interview (controls) to assess trans fat intake. Higher total trans fat in red blood cell membranes was associated with a modest increase in the risk of primary cardiac arrest after adjustment for medical and lifestyle risk factors. While trans isomers of oleic acid were not associated with risk, higher levels of trans isomers of linoleic acid were associated with a three-fold increase in risk.