

Major types of dietary fat and risk of coronary heart disease: a pooled analysis of 11 cohort studies. Marianne U Jakobsen et al. *Am J Clin Nutr* 2009;89(5):1425-1432.

Background: Saturated fatty acid (SFA) intake increases plasma LDL-cholesterol concentrations; therefore, intake should be reduced to prevent coronary heart disease (CHD). Lower habitual intakes of SFAs, however, require substitution of other macronutrients to maintain energy balance. **Objective:** We investigated associations between energy intake from monounsaturated fatty acids (MUFAs), polyunsaturated fatty acids (PUFAs), and carbohydrates and risk of CHD while assessing the potential effect-modifying role of sex and age. Using substitution models, our aim was to clarify whether energy from unsaturated fatty acids or carbohydrates should replace energy from SFAs to prevent CHD. **Design:** This was a follow-up study in which data from 11 American and European cohort studies were pooled. The outcome measure was incident CHD. **Results:** During 4–10 y of follow-up, 5249 coronary events and 2155 coronary deaths occurred among 344,696 persons. For a 5% lower energy intake from SFAs and a concomitant higher energy intake from PUFAs, there was a significant inverse association between PUFAs and risk of coronary events (hazard ratio: 0.87; 95% CI: 0.77, 0.97); the hazard ratio for coronary deaths was 0.74 (95% CI: 0.61, 0.89). For a 5% lower energy intake from SFAs and a concomitant higher energy intake from carbohydrates, there was a modest significant direct association between carbohydrates and coronary events (hazard ratio: 1.07; 95% CI: 1.01, 1.14); the hazard ratio for coronary deaths was 0.96 (95% CI: 0.82, 1.13). MUFA intake was not associated with CHD. No effect modification by sex or age was found. **Conclusion:** The associations suggest that replacing SFAs with PUFAs rather than MUFAs or carbohydrates prevents CHD over a wide range of intakes.

Fatty acids and cardiovascular disease. Jean-Michel Lecerf . *Nutr Rev* 2009;67(5):273-283.

Abstract: Fatty acids have been classified into "good" or "bad" groups according to their degree of unsaturation or whether they are "animal fat" or "vegetable fat". Today, it appears that the effects of fatty acids are complex and vary greatly according to the dose and the nature of the molecule. Monounsaturated fatty acids are still considered as having a "neutral" status, but any benefits may be related to the chemical environment of the source food or the associated overall food pattern. Controversy surrounds omega-6 polyunsaturated fatty acids, because even though they lower LDL cholesterol levels, excessive intakes do not appear to be correlated with cardiovascular benefit. The omega-3 fatty acids are known to exert cardiovascular protective effects. Dairy fat and its cardiovascular impact are being evaluated. This review examines the existing literature on the relationships between the different fatty acids and cardiovascular disease. **Keywords:** cardiovascular risk • dairy fat • saturated fatty acids • unsaturated fatty acids.

Anti-inflammatory and cardioprotective effects of n-3 polyunsaturated fatty acids and plant sterols in hyperlipidemic individuals. Michelle A. Micallef and Manohar L. Garg. *Atherosclerosis* 2009;204(2):476-482.

Background: Risk factors of cardiovascular disease such as lipid aberrations, hypertension, abdominal adiposity and elevations in systemic inflammation, are prominent aetiologies in hyperlipidemia. Supplementation with n-3 PUFA is associated with a reduction in cardiovascular events through its hypotriglyceridemic, anti-aggregatory and anti-inflammatory properties. Plant sterols have potent hypocholesterolemic properties, although their effect on the inflammatory cascade is uncertain. This study investigated the effect of combined supplementation with n-3 PUFA and plant sterols on cardiovascular risk factors, blood pressure, body composition, markers of systemic inflammation and overall risk, in hyperlipidemic individuals. **Methods:** The study was a 3-week randomised, double-blind, placebo-controlled, 2 × 2 factorial design, in four parallel groups. Sixty hyperlipidemic participants were randomised to receive either sunola oil or 1.4 g/d n-3 PUFA capsules with or without 2 g plant sterols per day. **Results:** The combination of n-3 PUFA and plant sterols reduced several inflammatory markers. High sensitivity C-reactive protein (hs-CRP) was reduced by 39% (P = 0.009), tumor necrosis factor- α (TNF- α) by 10% (P = 0.02), interleukin-6 (IL-6) by 10.7% (P = 0.009), leukotriene B4 (LTB4) by 29.5% (P = 0.01) and adiponectin was increased by 29.5% (P = 0.05). Overall cardiovascular risk was reduced by 22.6% (P = 0.006) in the combination group. **Conclusion:** We have demonstrated, for the first time that dietary intervention with n-3 PUFA and plant sterols reduces systemic inflammation in hyperlipidemic individuals. Furthermore, our results

suggest that reducing inflammation provides a potential mechanism by which the combination of n-3 PUFA and plant sterols are cardioprotective. **Keywords:** Cardiovascular disease; Hyperlipidemia; Inflammation; Omega-3 fatty acids; Plant sterols.

Cardiovascular risk factors in young, overweight, and obese European adults and associations with physical activity and omega-3 index. Alfons Ramel et al. *Nutr Res* 2009;29(5):305-312.

Abstract: Excess body fat is associated with increased cardiovascular disease (CVD) risk. The hypothesis of the study was that physical activity and omega-3 index, a marker of past long chain n-3 polyunsaturated fatty acids consumption, counteract the negative associations between fatness and CVD risk factors in young overweight and obese adults. A total of 324 subjects (20-40 years, body mass index [BMI], 27.5-32.5 kg/m², from Iceland, Spain, and Ireland) were investigated cross-sectionally. Dietary intake, anthropometric measurements, blood pressure, CVD risk factors, and fatty acids in erythrocyte membrane were analyzed. Information on physical activity was collected. Linear models were constructed to find out the associations of BMI, physical activity (quartiles), and omega-3 index with CVD risk factors. The most frequently increased risk factors were blood lipids (41.4%) and blood pressure (32.1%); fewer participants experienced disturbed glucose metabolism (11.8%). Body mass index was significantly associated with increased CVD risk factors ($P = .001-.029$), with the exception of total cholesterol, low-density lipoprotein, and high-density lipoprotein. The highest physical activity quartile had a lower fat mass ($P = .005$, at a given BMI), leptin ($P = .008$, in male participants only), and interleukin 6 ($P = .021$) but higher high-density lipoprotein ($P = .020$) than other quartiles; however, an approximate dose-response relationship could only be observed for leptin. The omega-3 index was not associated with lower low-density lipoprotein ($P = .056$), but docosahexaenoic acid in erythrocyte membrane was associated to it ($P = .016$). It is concluded that physical activity and docosahexaenoic acid diminish some of the negative health effects associated with overweight and obesity; however, body fatness remains the most important variable associated with increased CVD risk factors in young overweight and obese adults. **Keywords:** Cardiovascular risk factors; Physical activity; Omega-3-index; BMI; Human.