

Summary of Presidential Advisory from American Heart Association (AHA)

The AHA have concluded evidence supports advice to reduce saturated fat and replace it with polyunsaturated and monounsaturated fat.

The focus of this review is to show that saturated fat is a risk factor for the development of cardiovascular disease (CVD). And, that replacement of saturated fat with carbohydrates from wholegrains or polyunsaturated fat is considered desirable.

Replacement of saturated fat with n-6 polyunsaturated fat (linoleic acid) is recommended. Researchers state trials that support monounsaturated fat are lacking.

The core of this review is based on systematic reviews and meta-analyses. In particular, 4 trials comparing high saturated with high polyunsaturated fat intake from the **1950's and 60's** that reported a reduction of serum cholesterol levels by replacing saturated fat from animal sources with polyunsaturated fats. More recent trials with mixed dietary intervention have been excluded. The researchers noted that adding trials not considered suitable diluted the effect of the core trials. Non-human primate trials have also been used to support these recommendations.

Core trials considered:

- Dayton S, Pearce ML, Hashimoto S, Dixon WJ, Tomiyasu U. A controlled clinical trial of a diet high in unsaturated fat in preventing complications of atherosclerosis. *Circulation*. 1969;40(suppl II):II-1 –II-63 – Review of 846 men, mean age 65 years, 30% with CVD. Followed over 8 years at the Wadsworth Hospital and Veterans Administration Center in Los Angeles. Corn, soybean, safflower and cottonseed oils replaced saturated fat in the control diet. Serum cholesterol levels were reduced by 13% with 20% fewer primary events in the diet group.
- Leren P. The Oslo Diet-Heart Study: eleven-year report. *Circulation*. 1970;42:935–942 – 412 men who had had a heart attack were divided into two groups. One follow their usual diet, which the other were changed to a low saturated, high polyunsaturated diet. The low fat diet group lowered serum cholesterol by 14%, with the effect sustained over the 5 year trial period.
- Controlled trial of soya-bean oil in myocardial infarction. *Lancet*. 1968;2:693–699 – study followed 393 men after heart attack. Saturated fat from animal products was replaced with 86 g/d soybean oil. Half the oil was drunk with fruit juice and the rest used for cooking. Serum cholesterol was lowered by 16%.
- Turpeinen O, Karvonen MJ, Pekkarinen M, Miettinen M, Elosuo R, Paavilainen E. Dietary prevention of coronary heart disease: the Finnish Mental Hospital Study. *Int J Epidemiol*. 1979;8:99–118; Miettinen M, Turpeinen O, Karvonen MJ, Elosuo R, Paavilainen E. Effect of cholesterol-lowering diet on mortality from coronary heart-disease and other causes: a twelve-year clinical trial in men and women. *Lancet*. 1972;2:835–838; Miettinen M, Turpeinen O, Karvonen MJ, Elosuo R, Paavilainen E.

Effect of cholesterol-lowering diet on mortality from coronary heart-disease and other causes: a twelve-year clinical trial in men and women. *Lancet*. 1972;2:835–838 – compared the diets of 1222 patients at 2 psychiatric hospitals, one high in polyunsaturated fat from soybean oil and the other high in saturated fat. 2 cohorts one with patients with evidence of CHD and one without. The study included men and women. Serum cholesterol was 14% lower on the high polyunsaturated diet.

Key Points

- ❖ A fixed-effects meta-analysis was performed on the 4 core trials the results of which showed that lowering saturated fat and replacing it with vegetable oil rich in polyunsaturated fat, primarily soybean oil, lowered CHD by 29%. The research team used 'The Keys equation' to estimate the effect lowering of reduced cholesterol intake on serum cholesterol.
- ❖ Manufactured trans fatty acids are recognised as being harmful. Advice is to remove from diet.
- ❖ Linolenic acid - the review found there is no clear evidence that α -Linolenic acid reduces the overall incidence of CVD, although a higher intake of α -linolenic acid may reduce fatal CHD.
- ❖ Type of LDL was briefly discussed, however focus was on reduction of overall LDL by replacing saturated fat with polyunsaturated or monounsaturated.
- ❖ Discussion of HDL cholesterol suggests that lowering of HDL cholesterol is also desirable by increasing carbohydrate and monounsaturated or polyunsaturated fats and decreasing saturated fat intake.
- ❖ Common saturated fats (lauric, myristic, palmitic acids and stearic acids) were found to increase LDL cholesterol, whilst their replacement with monounsaturated or polyunsaturated fats lowers LDL cholesterol.
- ❖ Coconut oil has been singled out in the report for criticism because "*coconut oil increases LDL cholesterol, a cause of CVD, and has no known offsetting favorable effects*". The report advises against the use of coconut oil.
- ❖ Dairy is discussed in relation with cheese being singled out as being 'bad'. Wholegrain's are considered to be heart protective and better than saturated fat.
- ❖ Omega 3 fats from marine sources were not considered to relate to the topic being discussed despite their role in reduction of inflammation.
- ❖ The ratio of Omega 3:6 fats and the pro-inflammatory nature of omega 6 fats was not considered.

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- ❖ Mediterranean diets - conclusions were based on the Lyon Study and PREDIMED trial. Based on these 2 randomised clinical trials and observational studies researchers concluded a low fat mediterranean dietary pattern lowers the incidence of CVD.
- ❖ Children - reduced saturated fat intake within a healthful dietary pattern is feasible and effective for maintaining reduced LDL cholesterol as a preventative measure against CVD in children.
- ❖ There is an overall focus on the supposed risk of higher LDL cholesterol in relation to CVD risk. Discussion has not included the different types of LDL. Evidence showing increased HDL cholesterol levels has been discounted where LDL levels also increase.
- ❖ The reported cholesterol effects of these studies are at best modest. It is worth noting that studies looking at low fat diets showed very limited lowering of cholesterol or CVDs. Common to all studies used is the fact that the effect of fats has been studied in isolation and not considered in relation to other dietary components.
- ❖ The role of inflammation in the development of CVD has not been considered despite many studies supporting this mechanism.