THE CHOLESTEROL CONTROVERSY – PART I

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The relationship between saturated fats and cholesterol in foods, and blood cholesterol levels and cardiac pathology, is the most serious current controversy in nutritional science. It is not only confusing doctors but also undermining the credibility of medical science among the general public.

Generations of doctors that since the 1950s had been led to believe that too much dietary saturated fats and cholesterol was linked to increased risk of atherosclerotic cardiovascular disease, are now expected to accept claims that this was all a fable based on bad science. This must be one of the most serious U-turns in medical science. How could this have happened?

As Richard Smith, former editor of the *British Medical Journal,* said recently about this controversy, "over 40 years I've come to recognise what I might have known from the beginning, that science is a human activity with the error, self-deception, grandiosity, bias, self-interest, cruelty, fraud and theft that is inherent in all human activities (together with some saintliness), but these new revelations shook me".

Ancel Keys, a Minnesota University biologist, launched his "diet-heart hypothesis" at a meeting in 1952 at the peak of the US's heart disease epidemic, by showing a close correlation between heart disease deaths and the dietary fat content in men from Japan, Italy, England and Wales, Australia, Canada and the US.[1] Keys studied few men and had no accurate method for diet assessment and, with the Japanese and Italians, he studied them during food shortages soon after the war. Other researchers studying 22 countries found little correlation between cardiac mortality and fat consumption, and suggested that there might be other causes, including tobacco and sugar consumption.[2]

Following severe criticism of Keys' hypothesis at a WHO meeting in 1955, he designed the Seven Countries Study, published in 1970, showing a strong correlation between saturated fat and cardiac deaths.[3] Keys did not select counties like France, Germany and Switzerland (where the correlation wasn't so neat), and in Crete and Corfu he studied only 9 men. Although the study had 12,770 participants, diet was evaluated in only 3.9%, and some of the Greek studies were during Lent when no animal products were eaten. A follow-up of Keys' study (1984) showed that variation in saturated fat consumption could not explain variation in cardiac mortality.[4] An analysis of the Seven Countries Study's data (1999) showed a higher correlation of cardiac deaths with sugar products and pastries than with animal products.[5] John Yudkin, a London physiology professor, had proposed in the late 1950s that sugar might be more important than fat in cardiac pathology,[6] but Keys dismissed his hypothesis as utter nonsense. Other scientists critical of Keys' hypothesis were steadily silenced, not least through difficulty getting funding to challenge Keys.

A series of interventional studies tried to test the fat hypothesis, but they were small, short term, and suffered from the problem of changing more than one variable at once. A *Lancet* editorial (1974) said that little could be concluded from them.[7] The American Heart Association (1961) recommended the substitution of saturated fat with polyunsaturated fats (corn or soybean oil).[8] Through the political process, the fat hypothesis massively changed the US and subsequently, international diet.

The Women's Health Initiative was the saturated fat hypothesis' greatest test, enrolling 49,000 premenopausal women in a randomised trial lasting 10 years.[9] The low fat arm reduced total fat consumption from 37% to 29% of energy intake and saturated fat from 12.4% to 9.5%. There was no reduction in cardiac disease or stroke, and no more weight loss than controls. A 2010 review concluded that there was no evidence that a high fat diet causes heart disease.[10] A 2012 Cochrane review of 24 comparisons with 65,508 participants found no benefit from total fat reduction and no effect on cardiovascular or total mortality.[11]

With the fat hypothesis falling apart, Walter Willet, Harvard epidemiology professor, together with colleagues in Italy and Greece, started promoting the "Mediterranean" diet. The science behind it was weak, as a Cochrane review found.[12]

A 2015 study followed 2,412 angiogram-documented coronary artery disease patients for an average of 4.8 years, noting angina development or myocardial infarction in 292 (12%). They looked at saturated fat consumption, dividing them into four groups, group one with the lowest intake and group four with the highest. The high saturated fat patients had 15% less complications than the low-fat group but was not statistically significant. However, the authors could conclude, "there was no association between dietary saturated fats and incident coronary events or mortality in patients with established coronary artery disease".[13]

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