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Saturated fatty acid intake as a risk factor for cardiovascular disease in affluent, healthy Caucasian adults: a systematic review and meta-analysis

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Cardiovascular disease (CVD) is the leading cause of premature death globally⁽¹⁾. Consequently, finding ways to decrease mortality/morbidity rates and prevent incidence is of paramount importance for governments and public health bodies. For the past 50 years saturated fatty acids (SFA) have been implicated as one of the main dietary risk factors for CVD. In light of this, national guidelines have recommended limiting SFA to <10% of total daily energy intake or <20 g.day⁻¹⁽²⁾. However, recent literature has begun to question this advice due to contra evidence showing SFA not to be a risk factor for CVD⁽³⁾.

A systematic review and meta-analysis, was conducted in order to determine whether SFA was or was not a risk factor for CVD within affluent Caucasian populations. Several electronic research databases were searched using variations of the keywords “saturated fatty acids” and “cardiovascular disease”. Articles were only included if they had a randomised control trial (RCT) or prospective cohort (PC) study design and were published between 2000 and 2012. Articles were only included with participants fulfilling the following criteria: Caucasian, 18–65 years, non-smokers, normal BMI, classed as healthy, no pre-existing CVD related conditions, not taking cholesterol altering drugs and no inborn errors of lipid metabolism. In the PCs, only data which was adjusted for these factors was included. An expert in the field was contacted to ensure that sufficient retrieval had occurred. Articles were then assessed for quality using the Jadad scoring⁽⁴⁾/CASP tool and assessed for confounding variables, risk of bias and homogeneity.

A total of 411 articles were identified. Eight articles were included after exclusion for duplication, study design, not meeting full inclusion criteria, low quality, confounding variables, high risk of bias and heterogeneity. Of these, 4 were RCTs and 4 were PCs and a total of 193,409 participants were included (192,686 female, 723 male). For the RCTs, LDL-cholesterol concentration post high/low SFA intervention was used as a functional biomarker for CVD risk. For the PCs the number of CVD related events in the low/high SFA diet groups was used as the marker for CVD risk. In the RCT meta-analysis there was a standard mean difference (95%CI) of -0.94 (-1.17 , -0.71) ($p < 0.00001$) favouring the low SFA diet to decrease the risk of CVD. In the PC meta-analysis there was a risk ratio (95%CI) of 1.00 (0.64 , 1.58) ($p = 1.00$) showing there to be no statistically significant relationship between SFA and CVD.

In conclusion, SFA did not increase CVD risk in affluent Caucasian adults. Therefore, national/global guidelines may need to be reconsidered to reflect this. Further research should focus on *trans* fats and carbohydrates as a possible dietary factor for increased CVD risk.

1. World Health Organisation. (2011) *Global status report on noncommunicable diseases 2010*. WHO. Report number: WT 500.
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3. Parodi PW (2009) Has the association between saturated fatty acids, serum cholesterol and coronary heart disease been over emphasized? *Int Dairy J* **19**, 345–361.
4. Jadad AR, Moher D, Nichol G *et al.* (1995) Assessing the quality of randomised controlled trial: An annotated bibliography of scales and checklists. *Control Clin Trials* **16**, 62–73.