

Dairy: an over emphasis on saturated fatty acids

New evidence



Milk or other dairy product consumption and cardiovascular health

Milk and other dairy have been linked to cardiovascular disease risk by increasing SFA intake and serum cholesterol levels. This association is now being increasingly questioned:

- **Dairy intake does not conclusively lead to coronary heart disease.** A systematic review of prospective cohort studies found no consistent support for the notion that dairy consumption is associated with a higher risk of coronary heart disease.⁹ Mente *et al.* (2009) also reported that insufficient evidence exist for an association between milk consumption and coronary heart disease after a systematic review of evidence that suggest a causal link between various dietary factors and coronary heart disease. Similar findings were reported by German *et al.* (2009), whose review on prospective cohort studies showed no association between dairy intake and cardiovascular disease in seven of the twelve cohorts. Three of the studies even reported positive relationships between dairy foods and cardiovascular disease.²
- **Dairy consumption may reduce the risk of ischaemic heart disease and stroke.** Two meta-analyses of prospective studies on the consumption of milk and dairy foods and the incidence of vascular disease indicated an estimated 8% and 16% reduction in ischaemic heart disease and a 21% reduction in stroke events in subjects reported to consume the most milk, relative to those drinking the least milk within each cohort.⁵
- **Milk fat is associated with a lower risk of first myocardial infarction (MI) and stroke.** Waresnjo *et al.* (2009; 2010) investigated the association between serum milk fat biomarkers and a first MI and stroke. Milk fats were estimated by using plasma milk fat. Results showed that milk fat biomarkers were associated with a lower risk of developing a first MI and stroke, especially in women.

Milk and other dairy products can be eaten daily without increased risk of cardiovascular disease and may even have a cardio-protective effect. Analytical epidemiological studies suggest that the different saturated fatty acids (SFAs) found in dairy have different effects on serum lipid fractions.¹ Furthermore, several recent systematic reviews and meta-analyses fail to support previous studies that showed dairy to be associated with cardiovascular disease.²

Introduction

Many South Africans follow diets high in fat and SFAs and tend to exclude milk from their diet in pursuit of lower fat choices.³ Dairy consumption is further compromised by the perception that regular consumption of these products is unhealthy, particularly owing to its saturated fat content.⁴ In contrast, some recent studies report beneficial effects of milk and dairy products with regard to cardiovascular health.⁵

Different SFAs, different effects

The main SFAs implicated in cardiovascular disease, namely stearic, palmitic, myristic and lauric acid, differ in their effects on serum lipid profiles. Stearic acid, for example, has a neutral effect on total, low-density lipoprotein (LDL-C) and high-density lipoprotein (HDL-C) cholesterol, while lauric acid and myristic acid can cause a greater total cholesterol increase than palmitic acid would. Lauric acid has a beneficial effect on plasma lipids by decreasing the total-to-HDL cholesterol ratio because of an increase in HDL-C.¹ (Also see table below.)

Table: Effect of individual SFAs on lipid* profiles⁶ and contribution of these fatty acids to total SFA content of milk⁷

SFA	Total cholesterol	LDL-C	HDL-C	Triglycerides	Total-to-HDL cholesterol ratio	Milk	
						Fresh full-cream (g/100 ml)	Fresh low-fat/2% (g/100 ml)
Stearic (18 : 0)	Neutral	Neutral	Neutral	↔	Neutral	0.4 (21%)	0.28 (22%)
Palmitic (16 : 0)	↑	↑	Neutral	↔	Neutral	0.8 (42%)	0.53 (41%)
Myristic (14 : 0)	↑↑	↑	Neutral	↔	Neutral	0.3 (16%)	0.21 (16%)
Lauric (12 : 0)	↑↑	↑	↑	↔	↓	0.09 (5%)	0.07 (5%)

*Isoenergetic replacement of 1% dietary energy from carbohydrates with SFA.

The total SFA content of fresh full-cream milk is 1.93 g and of low-fat milk (2%) 1.30 g per 100 ml. Dairy products contribute relatively little to the SFA composition of the diet compared to other products of animal origin.

REFERENCES

1. Kris-Etherton PM, Innis S. 2007. Position of the American Dietetic Association and Dietitians of Canada: Dietary Fatty Acids. *J Am Diet Assoc.* 107:1599-1611.
2. German JB, Gibson RA, Krauss RM, Nestel P, Lamarche B, van Staveren WA, Steijns JM, de Groot LCPGM, Lock AL, Destaillets F. 2009. A reappraisal of the impact of dairy foods and milk fat on cardiovascular disease risk. *Eur J Nutr.* 48:191-203.
3. Wolmarans P, W Oosthuizen W. 2001. Eat fats sparingly – implications for health and disease. *SAJCN.* 14(3):S48-55
4. Elwood P. 2001. Milk, coronary heart disease and mortality. *J Epidemiol Community Health.* 55:375.
5. Elwood PC, Pickering JE, Givens DJ, Gallacher J. 2010. The consumption of milk and dairy foods and the incidence of vascular disease and diabetes: an overview of the evidence. *Lipids.* Published online: 16 April 2010
6. Mensink RP, Zock PL, Kester ADM, Katan MB. 2003. Effects of dietary fatty acids and carbohydrates on the ratio of serum total to HDL cholesterol and on serum lipids and apolipoproteins: a meta-analysis of 60 controlled trials. *Am J Clin Nutr.* 77:1146-1155.
7. Langenhoven M, Kruger M, Gouws E, & Faber M. 1991. South African food composition tables. 3rd ed. Cape Town: Medical Research Council
8. Siri-Tarino PW, Sun Q, Hu FB, Krauss RM. 2010. Meta-analysis of prospective cohort studies evaluating the association of saturated fat with cardiovascular disease. *Am J Clin Nutr.* 91:535-546.
9. Gibson RA, Makrides M, Smithers LG, Voevodin M, Sinclair AJ. 2009. The effect of dairy foods on CHD: a systematic review of prospective cohort studies. *Br J Nutr.* 102:1267-1275.
10. Mente A, de Koning L, Shannon HS, Anand SS. 2009. A systematic review of the evidence supporting a causal link between dietary factors and coronary heart disease. *Arch Intern Med.* 169(7):659-669.
11. Waresnjo E, Jansson J, Cederholm T, Boman K, Eliasson M, Hallmans G, Johansson I, Sjogren P. 2010. Biomarkers of milk fat and the risk of myocardial infarction in men and women: a prospective, matched case-control study. *Am J Clin Nutr.* 92:194-202.
12. Waresnjo E, Smedman A, Stegmayr B, Hallmans G, Weinehall L, Vessby B, Johansson I. 2009. Stroke and plasma markers of milk fat intake – a prospective nested case-control study. *Nutrition Journal.* 8.
13. Lamarche B. 2008. Review of the effect of dairy products on non-lipid risk factors for cardiovascular health. *J Am Coll Nutr.* 27(6):7415-7465.

FROM THE OLD HYPOTHESIS TO A NEW VIEW

Earlier reports of positive associations between SFA intake and the incidence of coronary heart disease led to the so-called "cholesterol hypothesis", which implies that all food containing SFAs of any kind increases the risk for cardiovascular disease. However, a recent meta-analysis of well-designed prospective epidemiological studies found no significant evidence for an association between dietary SFAs and increased risk of coronary heart disease, stroke or cardiovascular disease.⁸

CONCLUSION

Recent literature show no conclusive evidence for milk and other dairy as a food group being associated with increased risk for coronary heart disease. Dairy products in general, as well as their specific components, have furthermore been shown to have a positive effect on non-lipid cardiovascular disease risk factors such as blood pressure, inflammation, insulin resistance and type 2 diabetes, obesity and the metabolic syndrome. These findings suggest cardiovascular benefits of dairy foods that go beyond blood lipids.^{2,5,13} Milk and other dairy products can therefore be eaten every day as recommended by the South African Food-Based Dietary Guidelines, without increased risk of cardiovascular disease and possibly even fulfilling a cardio-protective role.

