

Dairy fat: does it increase or reduce the risk of cardiovascular disease?

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An important study published in the current issue of the Journal (1) reports on the association between dairy fat consumption and the risk of cardiovascular diseases (CVDs),³ coronary heart disease (CHD), and stroke with the use of data from 3 large US cohorts (5,158,337 person-years of follow-up). In addition to analyzing the associations with dairy fat intake by using models containing typical confounding factors such as age, smoking, and BMI, they also modeled isoenergetic replacement of dairy fat with other fat sources and carbohydrate in relation to CVD risk. The authors' conclusion was that dairy fat intake was not significantly associated with the risk of total CVD, CHD, and stroke, but replacing energy from dairy fat with PUFA-rich fat and whole-grain carbohydrates (but not refined starch and sugar) was associated with a significantly lower risk of CVD, CHD, and stroke. The results for CHD risk are in accordance with previously published pooled US cohort analyses that replaced the saturated fat with PUFAs (2), but also with meta-analyses of cohort studies (3) and a meta-analysis of 8 randomized controlled trials (RCTs) with "hard" CHD endpoints (4). The replacement of dairy fat with PUFAs leading to lower stroke risk seems to deviate somewhat from the traditional diet-heart hypothesis, and it is notable that the replacement analyses for stroke are very similar to those for CHD. To our knowledge, this has not been previously reported. The current study found that replacing dairy fat with other animal (presumably meat) fat was associated with an increase in CVD risk, but unfortunately, the sources of this fat were not defined. This is important because other studies have shown red and processed meat to be associated with increased CVD risk, whereas the opposite was the case for poultry meat (5).

A considerable limitation of the present study arises from the use of dairy fat without consideration of the dairy food that delivers it. It is complex to separate dairy fat from the dairy product in observational analyses with replacement models, because correlations between saturated fat from dairy products and the whole food itself will be high. A well-conducted RCT that exchanges dairy fat for fat from other sources in isoenergetic conditions is needed to find supporting evidence. As acknowledged by the authors, any impact of the food matrix could not be assessed but may well be important. A recent meta-analysis of RCTs compared blood lipid responses from butter and hard cheese and showed that cheese

lowered LDL cholesterol, and to a lesser extent HDL cholesterol, relative to butter, despite similar amounts of dairy fat in both the intervention and control groups (6). There are several proposed mechanisms for the so-called matrix effect of cheese. Cheese is a rich source of calcium, and there are indications that it forms insoluble soaps with fatty acids in the gut, leading to less fat being absorbed, as indicated by increased fecal fat excretion in some (7) but not all (8) studies. Lorenzen and Astrup (7) also reported increased fecal excretion of bile acids, possibly due to calcium phosphate binding, thus reducing the enterohepatic recycling of bile acids and resulting in the movement of plasma LDL cholesterol into the liver to support further bile acid synthesis. There is also evidence that dairy products with at least a proportion of the milk fat globule membranes intact will lead to less fat being absorbed (9).

Overall, the current study (1) confirms that dairy fat is not inherently associated with an increased risk of CVD, CHD, or stroke but highlights the importance of understanding the effect of replacing saturated (or dairy) fat with other dietary components. In part, the study supports the view long held by many, but not all, that replacement of saturated fats with PUFAs is likely to reduce the risk of CHD, but it also highlights that the situation is much more complex than that. The study also supports the concept of producing milk with reduced saturated fat content through changes to the diet of dairy cows, as highlighted by Markey et al. (10). However, because dairy foods are heterogeneous products, separate disease risk analysis by dairy fat content as well as type, such as milk, yogurt, and cheese, is important because differences in associations between dairy products and CVD risk can exist, as found previously in several studies (6, 11, 12). Finally, it is important to note that a reduction in dairy products in the diet in an attempt to replace some SFAs may lead to other problems, because dairy products are key sources of other nutrients, including protein, calcium, iodine, and vitamins B-2 (riboflavin) and B-12.

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³ Abbreviations used: CHD, coronary heart disease; CVD, cardiovascular disease; RCT, randomized controlled trial.

doi: 10.3945/ajcn.116.144766.

DIG had no conflicts of interest with any of the authors or institutions discussed in this editorial. He has recently received grants for dairy and health studies from the United Kingdom Medical Research Council and Dairy Council. SSS-M has received unrestricted grants in the past for meta-analyses on dairy products from the Dutch Dairy Association and Global Dairy Platform.

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