

Medical News & Perspectives

Whole-Fat or Nonfat Dairy? The Debate Continues

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It's been 40 years since the federal government first recommended that everyone except young children opt for low-fat or nonfat dairy products over high-fat dairy products as part of an overall goal of reducing saturated fat intake and calories.

A decade later, US sales of low-fat and skim milk combined exceeded those of whole milk for the first time, according to the International Dairy Foods Association. And in 2010, the Healthy, Hunger-Free Kids Act required that schools follow dietary recommendations and replace whole milk with nonfat or low-fat unflavored milk or nonfat flavored milk.

But some recent studies have suggested that high-fat milk, cheese, and yogurt are at least as healthful as their low-fat or nonfat counterparts, and their authors are questioning the wisdom of advising people to avoid whole milk and products made with it.

"I don't think there's enough evidence to recommend low-fat dairy," said cardiologist Dariush Mozaffarian, MD, dean of the Friedman School of Nutrition Science and Policy at Tufts University. However, Mozaffarian added, "I don't think there's enough evidence to recommend whole-fat dairy, either."

Although dairy products account for about 10% of total fats in the average US diet, "we've been making recommendations on them based on theories," he said.

Just as the evidence suggests that not all food sources of saturated fats—ie, animals, plants, and dairy—are the same, neither are all sources of dairy fats, Mozaffarian said. Because cheese is fermented and some yogurts contain probiotics, "they are probably better for you than milk," he said. And yet, Mozaffarian said, scientists and dietary guidelines tend to lump all dairy products together.

"This is a very complicated area, because dairy is not a homogeneous food," said Frank Hu, MD, PhD, MPH, chair of the nutrition department at Harvard University's T. H. Chan School of Public Health.



"Also, dietary patterns are very different among people who eat dairy products."

For example, Hu said, while US consumers chow down on cheeseburgers and pizza, Europeans are more likely to eat cheese for cheese's sake, not as a topping for foods that without it are already high in fat or sodium or both.

Teasing Out Dairy

Most of the evidence about the health effects of dairy products has come from observational studies. One of the largest to look at the association between dairy intake and cardiovascular disease (CVD) and mortality, the Prospective Urban Rural Epidemiology (PURE) study, involved 136 384 individuals aged 35 to 70 years in 21 countries on 5 continents. Participants recorded their intake of high-fat and low-fat milk, yogurt, and cheese on a food frequency questionnaire at the beginning of the study. During the 9.1-year follow-up, there were 6796 deaths and 5855 major cardiovascular events (death due to cardiovascular causes, nonfatal heart attack, stroke, or heart failure) among study participants.

A higher intake of total dairy, defined as more than 2 servings a day, was associated with a lower risk of death or a major cardiovascular event than no intake. However, the authors found no significant association between dairy intake and heart attack, and only consumption of milk and yogurt, not cheese or butter, was significantly associated with the studied outcomes.

Whole-fat dairy products appeared to be more protective than nonfat or low-fat products, which aren't available in some PURE countries, including India and South Africa, noted coauthor Mahshid Dehghan, PhD, an investigator with the Population Health Research Institute at McMaster University. "In some countries," Dehghan added, "daily [dairy] consumption is not part of the diet. In Malaysia, people do not drink milk or consume yogurt."

Because of these variations in dairy consumption, Dehghan and her coauthors, who included Mozaffarian, conducted a subgroup analysis to determine whether the associations between dairy intake and outcomes were similar in each region. To minimize the possibility of reverse causality, they excluded people

with known CVD, who might be more likely to choose lowfat or nonfat dairy.

"The consistency of results across regions with markedly different lifestyles makes it less likely that confounders, which are likely to vary in different regions, explain our observations," the authors concluded.

However, the PURE study didn't adjust for many socioeconomic variables that could influence individuals' risk of CVD and death, Hu said. For example, he said, in poorer, developing countries, "if you have more money, you can afford to buy dairy, meats, eat more protein, less carbohydrates," which leads to improved nutritional status compared with the poorest people in these countries. In other words, he said, dairy consumption alone might not deserve the credit for the better outcomes.

As John P. A. Ioannidis, MD, DSc, a professor at the Stanford Research Prevention Center, wrote in a recent *JAMA Viewpoint*, "extensive residual confounding and selective reporting" in nutritional epidemiologic research can lead to "implausible estimates of benefits or risks associated with diet."

Another problem, Hu said, is that the highest category of dairy consumption in PURE was only 2 servings a day. "That's not really generalizable to the United States," he said. After all, the US dietary guidelines recommend 3 servings a day (although less than 20% of the population meets or exceeds that goal, according to the [2015-2020 guidelines report](#)).

Looking at Biomarkers

The PURE study depended on participants' recall of their average daily dairy consumption for the past year. However, "self-reported consumption may be limited by errors or reporting bias," according to a recently published observational [study](#) that took a different approach. Besides, the authors continued, people might not be aware of how much dairy fat they're consuming in a range of foods, including baked goods, sauces, fried foods, and coffee drinks.

So instead of depending on study participants to accurately report their dairy intake, the authors looked at the relationship between circulating biomarkers of fatty acids found in dairy products and total mortality, cause-specific mortality, and CVD risk among 2907 US adults aged 65 and older who did not have CVD when the study be-

gan. The researchers measured participants' fatty acid concentrations at baseline and then 6 years and 13 years later.

During 22 years of follow-up, none of the fatty acids was significantly associated with total mortality. But high levels of one type of fatty acid, heptadecanoic acid, were inversely associated with CVD and stroke mortality. However, the authors note that other components of dairy products, such as protein, lactose, and minerals, could have confounded these findings.

Mozaffarian, a coauthor of the fatty acids and CVD risk study, and Hu were among the authors of a recent [article](#) examining the relationship of 3 fatty acids (that partly reflect dairy fat consumption) with type 2 diabetes risk. In their pooled analysis of 16 prospective cohort studies, totaling 63 682 adults who did not have diabetes at baseline, higher levels of the fatty acids were associated with a lower risk of type 2 diabetes.

While the biomarkers assessed are correlated with dairy intake, Hu said, he acknowledged that they have limitations. "This is a relatively crude estimate of the exact amount of intake," he said. Some fatty acids are produced endogenously, Hu said. In addition, an individual who drank 3 glasses of low-fat milk could have higher levels of the dairy fatty acids than someone who drank 1 glass of full-fat milk.

Although biomarkers aren't a perfect measure of dairy intake, "they're a step in the right direction," said Mario Kratz, PhD, a faculty member of the Nutritional Sciences Program at the University of Washington School of Public Health, who was not involved in either biomarker study.

Beyond Observational Studies

A randomized controlled trial would avoid the potential of confounding in observational studies that rely on biomarkers or food frequency questionnaires, Kratz said. But, he added, when he proposed seeking a National Institutes of Health grant to fund a randomized trial to study the health effects of dairy, a senior colleague advised him not to waste his time. That's because it's likely that at least 1 reviewer would think that the question had already been answered, according to his colleague.

"Our opinion is this was not fundable with public funds," Kratz said. Reluctantly, he said, he decided to seek industry funding instead.

Kratz raised \$1 million to fund his study from such organizations as the Dairy Research Institute, the [Dairy Farmers of Canada](#), and [Dairy Management Inc](#), all of whom took a risk, he said, because "it's not guaranteed that dairy will look favorable. We may be just fine without any dairy."

His trial has enrolled 75 men and women with [metabolic syndrome](#); as of mid-October, 72 participants had completed a 4-week wash-in period—in which they were given the option of consuming 3 servings of skim milk per week but no more—and the first clinic visit. After the wash-in period, participants have been randomized to 1 of 3 groups for 12 weeks: up to 3 servings of skim milk per week, 3.3 daily servings of nonfat or low-fat dairy, or 3.3 daily servings of full-fat dairy. The dairy products were weighed, packaged, and distributed to study participants via the Fred Hutchinson Cancer Research Center's Human Nutrition Laboratory (Fred Hutchinson provided approximately \$500 000 to fund the study).

Besides their dairy assignment, participants have been told to eat what they normally eat except for no dairy besides what is provided. Because food diaries are unreliable, Kratz said, study participants received surprise phone calls from dietitians asking what they had eaten in the previous 24 hours.

Kratz and his collaborators want to see how different amounts and types of dairy products affect blood glucose regulation and cardiometabolic health. "All of us are excited about the study, because we really have no idea what the results [will be]," he said.

Weighty Matters

One reason people opt for low-fat or nonfat dairy products is because they think consuming whole-fat milk, yogurt, and cheese will make them gain weight and will elevate their blood lipids.

However, "these are really rich sources of important nutrients," said Marcia de Oliveira Otto, PhD, assistant professor in the Department of Epidemiology, Human Genetics and Environmental Science at the UTHealth School of Public Health in Houston and a coauthor of the study that assessed dairy fat biomarkers and CVD risk.

In fact, Kratz said, "the data never overwhelmingly showed that full-fat dairy made you gain weight, contributed to heart

disease, contributed to metabolic disease." Actually, he added, "people who eat the most full-fat dairy products in observational studies are usually among the ones who gain the least amount of weight."

That seems counterintuitive, but, Kratz said, "it's very likely that there's a type of compensation going on." Low-fat or nonfat dairy isn't as filling as whole-fat dairy, so people might end up craving unhealthy snacks if they opt for the former, he said. However, he added, "I would never recommend people consume large amounts of butter and cream."

Time to Change Dietary Guidelines?

The US Department of Agriculture and the US Department of Health and Human

Services publish *Dietary Guidelines for Americans* every 5 years. Development of the 2020-2025 [guidelines is already under way](#), and de Oliveira Otto said that it might be time to revise the decades-old recommendation about choosing low-fat or nonfat dairy products over full-fat versions.

But Hu, who served on the panel that drew up the most recent *US Dietary Guidelines*, issued in 2015, continues to stand by that advice.

Members of the panel charged with writing the 2020-2025 *Dietary Guidelines* have not yet been selected, but, Hu said, he doesn't expect them to change the recommendation that favors low-fat and nonfat dairy products over high-fat dairy products. "As far as I can tell, the evidence

base hasn't really changed substantially," he said.

Hu recently coauthored a [review](#) of evidence about dairy products, dairy fatty acids, and the prevention of cardiometabolic disease. Although the more recent studies suggesting benefits of full-fat dairy were not included in his review, they would not have changed his conclusion that "more research is needed to examine health effects of different types of dairy products in diverse populations."

Meanwhile, Hu advises, "don't get overstressed about just one thing. Overall dietary pattern is very important, and dairy is only 1 of many food items on our plate." ■

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