



# Milking the Data

Does dairy burn more fat? Don't bet your bottom on it.

By David Schardt

## Theory, Theory on the Wall

**Y**ou've probably seen the ads in U.S. magazines or on cable or satellite TV. "Milk-cheese-yogurt. Burn more fat, lose weight." Drink 24 ounces (3 cups) of milk every 24 hours and that skinny hourglass figure will be yours. Eat three servings of yogurt every day and squeeze into that itty-bitsy bikini.

Here's what the ads *don't* say:

- Only three small published studies have found greater weight loss in people who were told to cut calories and eat dairy foods, and all were done by one researcher with a patent on the claim.
- The U.S. government's expert nutrition advisory panel has called the evidence on dairy and weight loss "inconclusive."
- Two new studies have found that dairy foods don't help people lose weight.

But why blame the dairy folks? They probably didn't want to bog the ads down with too much detail.

The poor dairy industry. People consume far less milk than they used to. Soft drinks have stolen away teenage and adult customers. And nutrition experts routinely criticize the saturated fat in cheese.

Michael Zemel to the rescue. The University of Tennessee nutrition researcher comes armed with a few small studies in people, a book, and an idea (plus a patent) for selling dairy foods that even he admits sounds "pretty outrageous"—eating three servings of milk, cheese, or yogurt every day can help dieters lose weight.

Never mind that the studies are small and that no independent researchers have corroborated their findings. Producers have tons of milk and cheese to move.

Solution? Launch what the U.S. industry calls "a full court press of marketing activities" to capitalize on the weight-loss claim before the authorities catch up with you.

Hire the world's largest promotions agency. Pay celebrities like Dr. Phil McGraw to say in milk mustache ads that "drinking milk can help you lose weight." Give away 24 convertibles in 24 days to reinforce the idea that 24 ounces of milk every 24 hours melts away fat. Launch "The Great American Weight Loss Chal-

lenge," a 12-week program centred around drinking 24 ounces of milk every day, and give US \$25,000 to the city that signs up the most dieters and US \$10,000 to a group that successfully completes the program.

And license Zemel's claim so that companies can use it to promote their dairy products for weight loss.

After two years and millions of dollars worth of advertising and giveaways, nearly half of all women in the U.S.—and who knows how many in Canada—have heard that dairy foods help people lose weight.

If only there were sufficient evidence to back up the claim.

In the early 1990s, Michael Zemel, a nutrition scientist at Wayne State University School of Medicine in Detroit, Michigan, was testing what happens when men with high blood pressure increase the amount of calcium they get by eating more dairy foods. After eating two cups of yogurt a day for a year, their blood pressures fell.

"But there was a result we didn't expect," Zemel recalls. The men lost an average of 11 pounds of body fat.

"It made no sense to me whatsoever," he says. "They didn't eat fewer calories and they didn't exercise more." But Zemel had no control group—men who ate no yogurt or a

yogurt-like food without calcium—so he couldn't tell what was causing the weight loss.

Other research seemed to suggest that there was something to the calcium-fat link. Among participants in a national survey of Americans, for example, fatter people consumed less calcium than thinner people.<sup>1</sup> Of course, it's hard to know whether something else about people who consume less calcium—maybe they drink more pop—influenced their weight.

In the late 1990s, Zemel, now at the University of Tennessee in Knoxville, tested his theory on animals. In several

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studies, obesity-prone mice on high-sugar, high-fat diets gained less (or lost more) weight when given calcium than similar mice fed the same diet with very little calcium. Mice that were given milk did even better.

By 2000, Zemel was ready to test dairy foods on humans. “We put 32 overweight people on a balanced but calorie-restricted diet for six months, which reduced their daily food intake by 500 calories,” he says.

Roughly a third of the 32 got the control diet, which consisted of, at most, one serving of dairy foods and 400 to 500 milligrams of calcium a day. Another third ate the same diet, but got an extra 800 mg of calcium from pills, which brought them up to about 1,200 mg a day. The remaining third were told to substitute three servings of dairy foods for other foods on the diet, which also gave them around 1,200 mg of calcium a day.

After six months, the three-dairy-a-day group had lost 24 pounds, the calcium-supplemented group 19 pounds, and the control group 15 pounds.<sup>2</sup>

With funding from General Mills, Zemel’s research group followed up with a similar study using yogurt. They put 34 overweight people on a calorie-restricted diet. Roughly half got 400 to 500 mg of calcium a day from foods other than dairy. The other half got about 1,100 mg of calcium a day, most of it from eating three six-ounce (170-gram) servings of Yo-plait Light (which, in the U.S., is made by General Mills).

After 12 weeks, the yogurt eaters had lost 15 pounds while the other group had shed 11 pounds.<sup>3</sup> And they lost an average of one

and a half inches from their waist, while the other group lost only a fifth of an inch.

In July, Zemel published a similar study in obese African Americans.<sup>4</sup> He found greater weight and fat loss in the 17 participants who were told to eat three servings of dairy a day than in the 12 who were told to eat lean meat instead. All were told to cut 500 calories from their usual diets.

That’s the extent of Zemel’s published research in people.

In 2002 the U.S. Patent Office issued Patent #6,384,087 to Michael Zemel, his wife, and another researcher, giving them

exclusive rights to the claim that calcium or dairy products can prevent or treat obesity. (The University of Tennessee owns the patent, but the U.S. dairy industry owns the exclusive rights to license the claim.)

That’s a lot of mileage to get out of something that can best be described as preliminary research.

### Size Matters

Maybe getting more calcium or calcium-rich dairy foods will help you lose weight. Maybe it won’t. Here are the limitations of Zemel’s studies and how their results are being misused.

■ **Size.** Zemel’s published studies looked at a total of just 46 people who consumed extra calcium from dairy foods. That’s largely why the U.S. government’s Dietary Guidelines Advisory Committee refused the U.S. dairy industry’s 2004 request that the Guidelines recommend that people eat milk, cheese, and yogurt to lose weight.

“We felt that the evidence for an effect of milk intake on weight loss was based on too few subjects to make a national recommendation,” says Janet King of the University of California at Berkeley and at Davis, who chaired the advisory committee of

13 nutrition experts appointed by the U.S. Departments of Agriculture and Health and Human Services.

“All of our recommendations in the Dietary Guidelines report were based on multiple randomized controlled trials of hundreds of individuals,” she says. “The

work on milk and weight loss was very limited by comparison.”

■ **Participants.** “I’ve always maintained that my work is relevant only to people who are consuming sub-optimal levels of calcium,” says Zemel. “If people have enough calcium in their diet, I would anticipate no additional weight loss from adding more.”

How much calcium does he consider “enough”? “My honest answer is I don’t know exactly,” says Zemel, who adds that he’s willing to defer to official recommendations—1,000 mg a day for adults 50 and

under and 1,200 mg for those over 50.

Yet none of the ads mention that dairy “burns more fat” only in people who get too little calcium. His papers note that the participants had been consuming no more than 600 mg of calcium a day before the studies began. But he doesn’t present results of blood tests to verify their low intake. And nowhere do his studies mention that previous calcium intake might matter or that the results may not apply to people who consume enough calcium.

■ **Foods.** Kraft has run television and newspaper ads in the U.S. encouraging consumers to burn fat by eating cheese (the ads were discontinued earlier this year). The front cover of Zemel’s book (“The Calcium Key”) says, “Enjoy cheese and your favorite dairy foods while you get thin.”

Yet the 18 dairy-dieters in Zemel’s Yoplait study ate yogurt, not cheese. And the 11 in his first study got at least half their dairy calcium from milk. (The rest came from some combination of yogurt and cheese.)

Zemel admits that he doesn’t know how much cheese the 11 were eating, or whether cheese had any impact on how much weight or fat they lost. “I just don’t have the data to answer the question,” he says. “But I do caution people not to get all of their dairy from cheese, because I don’t know that cheese by itself works.”

If something in dairy foods helps people lose weight, Zemel’s latest research suggests that it’s not in cheese.

“From our work in mice, we’ve found that the more active components of dairy tend to be concentrated in the whey, rather than in the curds,” he explains. Whey, which is in milk and yogurt, is discarded during the cheese-making process.

It’s not just Kraft that has exaggerated Zemel’s findings. There’s no evidence to support the milk industry’s claim that “more than a dozen research studies now support the finding that drinking 24 ounces of milk every 24 hours will help people lose more weight than just reducing their caloric intake.”

None of Zemel’s studies instructed people to drink 24 ounces of milk a day. And MilkPEP, the U.S. industry’s non-profit Milk Processors Education Program—it was formed to boost milk consumption and it promotes the “24 ounces in 24 hours” claim—couldn’t point us to a single study in which people did.

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## Beyond Zemel

"People have a funny sort of bias," says Steven Heymsfield, executive director of clinical sciences at the pharmaceutical firm Merck and former deputy director of the New York Obesity Research Center at St. Luke's-Roosevelt Hospital in New York City. "They like their own work better and they have ways of seeing things in it that others don't."

Before scientists accept the idea that eating more dairy foods helps people lose weight, cautions Heymsfield, "I think we need to see really good randomized trials from other people who don't have a vested interest in the results."

Since Heymsfield made those comments, two trials by other researchers found that people don't lose more weight when they eat more dairy foods.

Jean Harvey-Berino and her co-workers at the University of Vermont put 45 overweight, middle-aged men and women on a weight-loss diet, behaviour modification program, and exercise regimen. Half of them were assigned to eat about one dairy food a day, while half were told to eat three to four servings a day. After six months, both groups lost the same amount of weight and body fat.

"A high-dairy diet does not substantially improve weight loss beyond what can be achieved in a high-quality behavioural intervention," says Harvey-Berino. Her results, which were presented at a scientific meeting last year, are about to be published.

Jane Bowen and her colleagues at the University of Adelaide in Australia had similar results when they put 50 overweight, middle-aged men and women on weight-loss diets. Half consumed three dairy foods a day and half got the same amount of protein from foods with little or no calcium. After 12 weeks, both groups lost the same amount of weight and fat.<sup>5</sup> "Increased dairy foods does not affect weight loss," concludes Bowen.

Zemel says that he can't explain why the University of Vermont study seems to contradict his own research because the details haven't been published yet. But he has several theories to explain the out-



**Lose weight with dairy?** Only if you're overweight, if you've been eating too little calcium, and if your weight-loss diet isn't too high in protein or too low in calories, says Michael Zemel, the author of the dairy-burns-fat studies. Two other studies have found no impact of dairy on weight.

come of Bowen's Australian study.

First, he notes that Bowen's participants were eating substantially more calcium before the study started—750 to 950 mg a day instead of the 400 to 600 mg a day in his studies.

"To me, this is critical," he says. "My studies are correcting sub-optimal intakes. I think the Australian study may have been supplementing adequate intakes."

Furthermore, says Zemel, calcium and dairy may have had no impact on Bowen's dieters because both the high-dairy and the control groups were eating a high-protein diet. (Protein comprised roughly 30 per cent of their calories.)

"On these high-protein diets, they are very close to maximum fat loss, making additional increments due to dairy unlikely," he says. (Dairy would also have no impact, adds Zemel, if dieters were cutting 1,000 calories a day instead of 500 calories.)

However, he has never tested the assumption that dairy has no effect if

protein intakes are generous.

And his arguments don't explain away the Vermont research, where dieters got no more protein than the dieters in Zemel's three studies. Even so, those who ate dairy foods lost no more weight than those who ate a placebo.

What's more, the dairy industry's ads don't explain that Zemel's research only applies to people who are overweight. Referring to one of many studies that find no impact of calcium on weight in people who aren't overweight and aren't dieting, Zemel says, "there you were studying healthy, young women without calorie restriction. I would have anticipated no effect on body weight."

So why do the milk moustache ads and the U.S. Yoplait ads show women who clearly don't need to lose any weight?

"You want me to talk about data or belief?" Zemel asks. While he has no published research on dairy foods and normal-weight people, "my belief, which we're testing now, is that a dairy-rich diet will help prevent the unhealthy weight gain—one to three pounds per year—that would otherwise occur in most adults."

Never mind that a dozen studies show that extra calcium or dairy foods has no more impact than a placebo on weight gain in people who aren't overweight.<sup>6</sup>

The bottom line: the U.S. dairy industry's multi-million-dollar ad campaign—which most Canadians who read magazines or watch TV can't escape—rests largely on how 46 people reacted to eating more dairy foods in three small studies by one researcher with ties to the dairy industry.

Clearly, Zemel's studies raise some questions that other researchers ought to investigate. But the dairy industry apparently has no qualms about rushing to its ad agencies with preliminary evidence, as long as it can boost sales. 🌊

<sup>1</sup> *FASEB Journal* 14: 1132, 2000.

<sup>2</sup> *Obesity Research* 12: 582, 2004.

<sup>3</sup> *Int. J. Obes. Relat. Metab. Disord.* 29: 391, 2005.

<sup>4</sup> *Obesity Research* 13: 1218, 2005.

<sup>5</sup> *Int. J. Obes. Relat. Metab. Disord.*, Feb. 15, 2005 [Epub].

<sup>6</sup> *Journal of Nutrition* 133: 245S, 2003.