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FAT UNDER FIRE

New findings or shaky science?

"Study doubts saturated fats link to heart disease," reported *The New York Times* in March. ("Butter is Back," exulted *Times* columnist Mark Bittman.)

Yet just last November, the American Heart Association and the American College of Cardiology issued their long-awaited advice on diet and exercise. Their bottom line: cut saturated fat to half the earlier target levels.

What gives? Shaky science...and a mission by the global dairy industry to boost sales.

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FAT UNDER FIRE

New findings or shaky science?



Martijn Katan is an emeritus professor of nutrition at the Vrije Universiteit Amsterdam and a world-renowned expert on diet and cardiovascular disease whose pioneering research helped

document the harm caused by trans fat. He is a member of the Royal Netherlands Academy of Arts and Sciences. Katan spoke to *NAH's* Bonnie Liebman by phone from Amsterdam.

WHICH STUDIES?

Q: Why do some studies find no higher risk of heart disease in people who eat more saturated fat?

A: Not finding something can have two causes: either it's not there or the people who were searching didn't use the right method to search. The question is whether the observational studies that we're talking about are able to answer the question.

Q: You mean studies that ask people what they eat and then track them for years to see who gets heart disease?

A: Yes. Similar studies have always been unable to find an association between saturated fat intake and blood cholesterol levels. Now, the fact that saturated fat raises cholesterol, especially the bad LDL cholesterol, is beyond doubt. That has been shown in hundreds of trials that fed people different fats. Anyone who doubts it can do an experiment by himself.

Q: How?

A: Just buy one of those do-it-yourself cholesterol measuring kits, eat a lot of butter—which is high in saturated fat—

For decades, experts have advised us to replace saturated fats (in foods like meat, dairy, and butter) with unsaturated fats (in foods like oils, nuts, and fish). Now some controversial studies are challenging that advice. Here are the facts behind the headlines.

for a couple of weeks, and you'll see your LDL cholesterol go up. Then eat a lot of polyunsaturated oils for a couple of weeks, and you'll see your LDL cholesterol go down.

So if an observational study is unable to find even something that is as thoroughly established as that, we have to question why it doesn't find an association between saturated fat and heart disease.

Q: Why might observational studies miss the link?

A: For two reasons. First, the differences in saturated fat intake between people in the same population are small. And second, there's a lot of error in the dietary

Q: By too much error do you mean that people's diets are not measured precisely enough?

A: Yes. Some studies simply ask people, "What did you eat yesterday?" Well, what you ate yesterday may be vastly different from what you ate today.

Other studies ask how often you eat various foods. But that's only as good as the questionnaire you use. In some studies, questionnaires are limited to as few as 40 foods. That can never capture what people really eat.

Also, diets are assessed only at the start of most studies. So the researchers have no way of knowing if people may have changed their diets over the 10 to 15 years before they suffered a heart attack.

Those and other sources of imprecision may make it hard to know what people are really eating. And that makes it hard to see what would happen if people were to really change their diets.

Q: So observational studies can't tell us what would happen if someone replaced saturated fat with other fats or with carbs?

A: Right. These studies don't replace anything. They don't actually do any experiment. They just have this set of data showing that some people eat this and other people eat that—or at least this is what they *say* they eat—and then they analyze the data mathematically.

Unfortunately, the mathematics often fails to make up for the weaknesses in the data. You can easily get a wrong answer.



A key goal of the Global Dairy Platform: "neutralizing the negative image of milkfat by regulators and medical professionals."

data. If you look in detail at how these studies are done, everything works in favor of *not* finding an effect.

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Trade the sat fat in cream cheese for the unsaturated fat in peanut butter. Swap half the bagel for a banana.



THE DAIRY INDUSTRY WEIGHS IN

Q: Are some researchers intent on showing that saturated fat does not cause heart disease?

A: Unfortunately, yes. In November 2008, the global dairy industry held a meeting in Mexico City where they decided that one of their main priorities was to “neutralize the negative impact of milkfat by regulators and medical professionals.”

In my experience, people who work for dairy companies are very competent, highly motivated, and hardworking, and they really believe in milk. When they set out to do something, they get it done.

Q: And they wanted to make milk fat sound healthy?

A: Yes. They set up a major, well-funded campaign to provide proof that saturated fat does not cause heart disease. They assembled scientists who were sympathetic to the dairy industry, provided these scientists with funding, encouraged them to put out statements on milk fat and heart disease, and arranged to have them speak at scientific meetings.

And the scientific publications we’ve seen emerging since the Mexico meeting

have helped neutralize the negative image of milk fat.

The industry also attempted to water down the nutritional guidelines of the World Health Organization.



Many sandwiches get sat fat from both meat and cheese. Instead, try a turkey sandwich or veggie burger loaded with lettuce and tomato. Add mayo if you like.



Q: Are you saying that these publications involved fraud?

A: No. I do not mean that the data were fabricated. But the methodological limitations of observational studies make it easy to get the result that you think beforehand should be correct—namely, that saturated fat is not associated with heart disease. So the temptation to say, “OK,

I’ve got the right result...let’s publish it,” is very strong.

Q: Could some studies find that dairy eaters have no higher risk of heart disease because they’re health conscious?

A: Yes. People with a high dairy intake tend to be from a higher socioeconomic class, they’re more health conscious, and they smoke less. There’s a slew of characteristics of educated, health-conscious people, and dairy intake is one of them.

Q: You mean it’s hard to tell if dairy eaters do something else that matters?

A: Right. They may suffer fewer heart attacks in spite of a higher saturated fat intake. Is it because they don’t smoke

and are thin and exercise? Or is it because they know which doctor to go to and which medical advice to follow and which drugs to take and which drugs not to take? It could be anything.

Q: So you don’t know what’s the cause?

A: Right. You’re more likely to be dealing with a real cause when the association is very strong. For example, obese people are five times as likely to be diagnosed with type 2 diabetes as thin people. That’s unlikely to be a coincidence.

But if the risk of heart disease is only, say, 10 percent lower or higher among dairy eaters, the statistical techniques for eliminating confounding don’t work.

Q: Don’t some studies control for smoking, weight, exercise, and other potential confounders?

A: Yes, but there is always the problem that important things have not been



Remember when people didn’t order an entire personal pizza? Eat a small slice or two (with less cheese, no meat, and thin crust) and a salad.



measured or that they were imperfectly measured. These problems are too easily neglected in the scientific community.

RESULTS FROM TRIALS

Q: What is the evidence that saturated fat does harm the heart?

A: I'm a biochemist by training, and I have great faith in experiments, where you say, "We're only going to change

cholesterol falls—all these interventions, and, of course, the dietary interventions, lower the risk of heart disease.

So I'm not willing to throw all of that overboard just because in certain observational studies, certain scientists say, "We can't find convincing proof."

These are extraordinary claims and they require extraordinary evidence. It's just not there.



Meat and potatoes means sat fat and starch. You get more polys (and fewer carbs) from fish and vegetables. Add a side of salad with dressing and nuts instead of cheese.



one thing and keep everything else constant, and we're going to see what happens." You can get strong evidence from such experiments.

The experiments that replaced saturated fat from foods like butter and high-fat dairy or meat with polyunsaturated fats from corn or soybean or sunflower oil were not perfect. But they consistently showed a fall in coronary heart disease exactly to the extent that you would expect from the fall in LDL cholesterol.

Q: Those were clinical trials that randomly assigned people to eat either saturated or polyunsaturated fats?

A: Yes. So there's a consistent picture that anything that raises LDL cholesterol—be it diet or genes—raises the risk of heart disease. And most treatments that lower LDL cholesterol lower the risk of heart disease.

If you look at different types of interventions that lower blood cholesterol—whether it's drugs that inhibit cholesterol synthesis, or drugs that take bile acids out of your gut so that the body has to move more cholesterol from your blood into your gut, or even surgery that takes away part of your intestine so that your blood

Q: Why did the recent meta-analysis of trials cited by The New York Times find that polyunsaturated fats failed to lower the risk of heart disease?

A: The meta-analysis included a trial that gave people a margarine that was high in trans fat. When the authors omitted that trial, they found that people who replaced saturated with polyunsaturated fats had a 19 percent *lower* risk of heart disease. But the meta-analysis buried that finding in a supplement that didn't make the headlines.

Q: What about replacing foods high in saturated fat with carbs?

A: We don't have rigorous data on that.



Mac 'n cheese is a trendy side dish that's heavy on carbs and sat fat. Swap it for a bowl of beans...or a side of veggies.

In the few trials where saturates were replaced by carbs, the effect on heart disease was marginal.

Now, some people would argue that while replacing saturated fat with carbs lowers LDL, or bad, cholesterol, it also lowers HDL, or good, cholesterol. So you wouldn't expect much of a benefit. The question is: How important are changes in HDL?

Q: Doesn't HDL ferry cholesterol out of arteries?

A: There's an increasing concern that HDL may simply be an indicator of something else, and that HDL doesn't work to change your risk of heart disease.

Drugs that raise HDL haven't done anything to lower the risk of heart disease—unfortunately for me because I spent a major part of my career finding out what foods do to HDL.

Q: Didn't the biggest trial that replaced saturates with carbs actually replace very little?

A: Yes, these were minor changes, so the trial doesn't help you make up your mind. Also, we don't eat fatty acids and carbs, we eat foods. So the question arises: What do you mean by a high-carb diet? Is it a diet high in soda or is it a diet high in beans? That could make a difference.

Q: Are monounsaturated fats from foods like olive oil good?

A: We don't have the solid evidence for monos that we have for polys. We do have evidence that replacing saturated fat with monounsaturated fat lowers LDL cholesterol, though not as much as polys do. And the default assumption should be that if you lower your LDL cholesterol,



you lower your risk of heart disease.

That would be reason enough to say, “If you like olive oil, go ahead—it’s very likely that it will lower your heart disease risk.” Also, the countries where people eat huge amounts of olive oil have low heart disease risk, so that makes it more plausible.

Q: Does it matter if the polys you eat are rich in omega-3 fats?

A: In the high-quality controlled experiments that have been done over the last five or ten years, the omega-3s from fish oil—EPA and DHA—have shown less and less of an effect on heart disease risk.

It’s embarrassing, since we’ve been telling people to eat omega-3 fatty acids because they are wonderful for the heart. And some people have been saying that omega-3s are wonderful for anything that ails you.

Q: What about the omega-3s in plants, like the alpha-linolenic acid in canola, soybean, and flaxseed oil?

A: There’s much less data on them. I’ve been involved in the large Alpha Omega Trial, which gave heart attack survivors an extra two grams a day of alpha-linolenic acid—about what you’d get in 1½ tablespoons of canola oil. And it didn’t do a thing. So oils that are high in alpha-linolenic acid may be no better than oils without it.

Q: Is it harmful to eat more omega-6 fats—which are found in some oils and nuts—than omega-3 fats?

A: No. There have been heated discussions about how bad a high omega-6 to omega-3 ratio could be. Most of the evidence is from test-tube and rat experiments. There is little evidence that this ratio affects human health.

Q: So omega-6s may protect the heart as much as omega-3s?

A: Yes. They may even be better. The bottom line is to replace saturated fats with polyunsaturated fats.

I am not ready to give up on omega-3s yet, but you’re better off getting them from fish, not fish oil capsules. Even if fish oil is not as great as we thought, fish still provides nutrients like vitamin D, protein, and iron.

BEYOND FATS

Q: Besides replacing sat fat with polys, what else can people do to protect their heart?

A: This may sound surprising, but saturated fat is not the issue that it was 30, 40, 50 years ago. That’s not because it’s less harmful. It’s because we have changed our diets.

Less of our fat is saturated, and blood cholesterol levels have gone down markedly since the days when President Eisenhower had his heart attack.







And in the Netherlands, just about everybody who’s at risk for heart disease is taking statins. That has a huge effect on cholesterol levels. The big issue now is not cholesterol, but obesity.

Q: Because it leads to diabetes and the metabolic syndrome, which raise the risk of heart disease?

A: Yes. And obesity is not caused by carbs or fats or proteins or whatever. That has caused a huge amount of confusion.

What to Eat

To keep a lid on your LDL cholesterol (and your blood pressure and blood sugar), eat a diet that’s based on the OmniHeart and DASH studies (see *NAH*, Oct. 2009, p. 1). It’s rich in vegetables, fruit, and fiber, and low in sugar, carbs, and saturated fat. A 2,100-calorie diet should have:

		Daily Servings
	Vegetables & Fruit (½ cup, 1 cup greens, 1 piece fruit)	11
	Grains (½ cup pasta, rice, or cereal, 1 slice bread)	4
	Low-fat Dairy (1 cup milk or yogurt, 1½ oz. cheese)	2
	Legumes & Nuts (½ cup beans, ¼ cup nuts, 4 oz. tofu)	2
	Poultry, Fish, Lean Meat (¼ lb. cooked)	1
	Oils & Fats (1 Tbs.)	2
	Desserts & Sweets (1 tsp. sugar, 1 small cookie)	2
	Wild Card Poultry, Fish, Meat or Oils & Fats or Grains or Desserts & Sweets	1

Obesity is caused by foods that are tasty, attractive, cheap, convenient, and present 24/7. The easiest way to realize that is to think of foods that we all know to be obesogenic, like a double hamburger, a large Coke, french fries, and ice cream.

Just before you’re going to eat it, put it into a bucket and stir it around. The fats and carbs are the same, but it’s no longer obesogenic, because it’s disgusting.

Q: So the problem is that we’re surrounded by appealing foods?

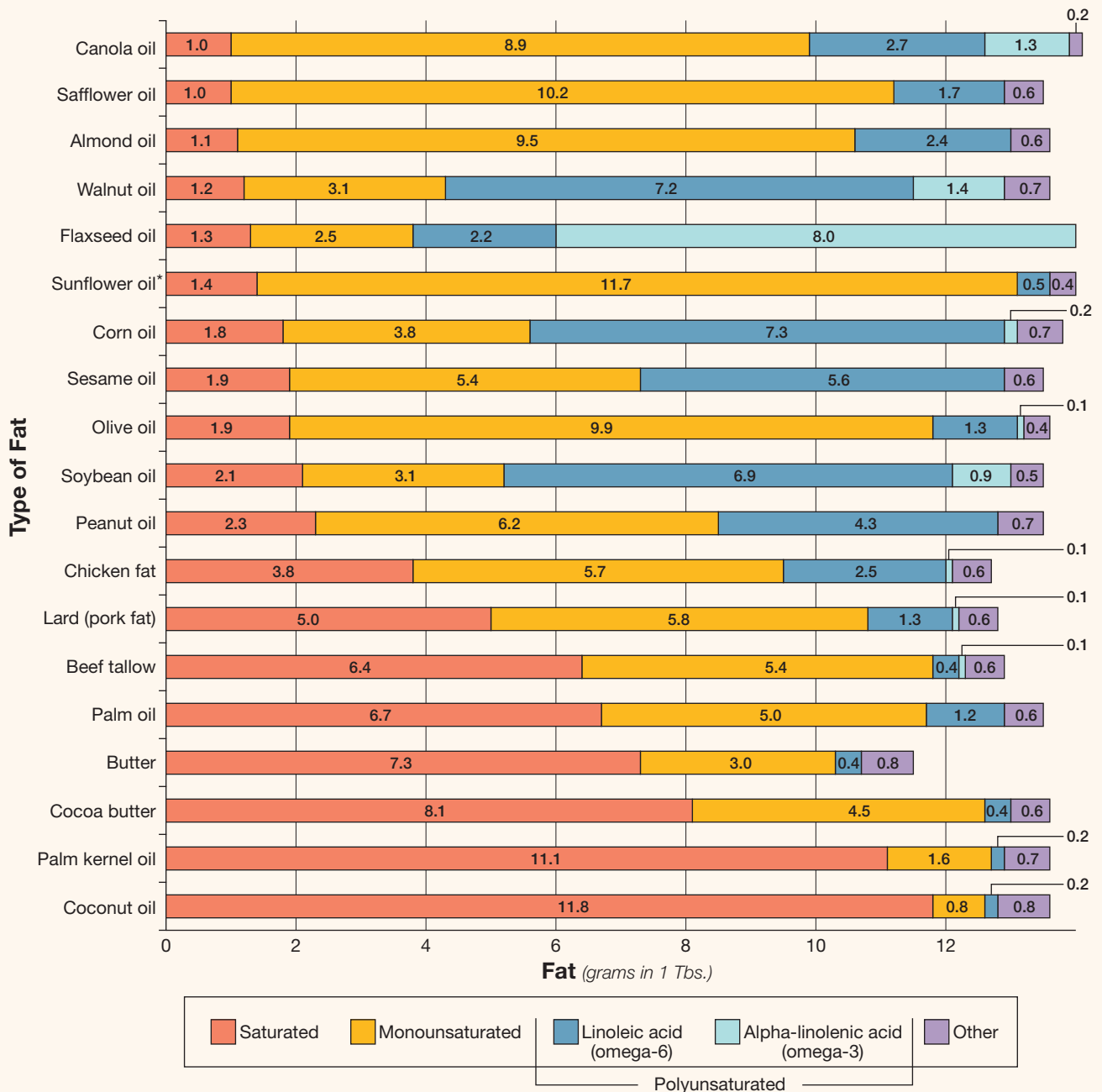
A: Yes. It’s this intricate wizardry that the food industry does with our foods that makes us want to eat more. It’s not just the salt, fat, or sugar. It’s also the sound



Most sweets are high in sat fat, white flour, and sugar. You’re better off with fruit and low-fat yogurt for dessert...and maybe a small cookie on the side.

Oil in the Family

All fats are a mix of saturated, monounsaturated, and polyunsaturated fatty acids (though we usually categorize each by the fatty acid it has the most of). Odds are, you get mostly soybean oil in prepared foods (like salad dressings, mayonnaise, and margarine) and restaurant foods. So you'll probably end up with a good mix of unsaturated fats if you use canola oil (and olive oil when you want its flavor) for cooking.



* Sunflower seeds are lower in monounsaturated fat and higher in linoleic acid than sunflower oil. The fats in almonds, walnuts, peanuts, sesame seeds, flaxseeds, and coconuts are similar to their oils.

Sources: USDA National Nutrient Database for Standard Reference (Release 26), National Sunflower Association, Flax Council of Canada.

that the food makes when you chew it. It's the smell, and which smells are released in your mouth after one second, two seconds, four seconds. Also, that food is cheap and easy to stuff in your mouth.

This is a billion-dollar industry. And that is what is making us fat. Trying to couch that in terms of fat or carbs obscures the issue. 🍷

Key Studies

Latest meta-analysis: *Ann. Intern. Med.* 160: 398, 2014.
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 doi:10.1161/01.cir.0000437740.48606.d1.
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