



Clarifying the facts on fat

Is Butter Really Back?

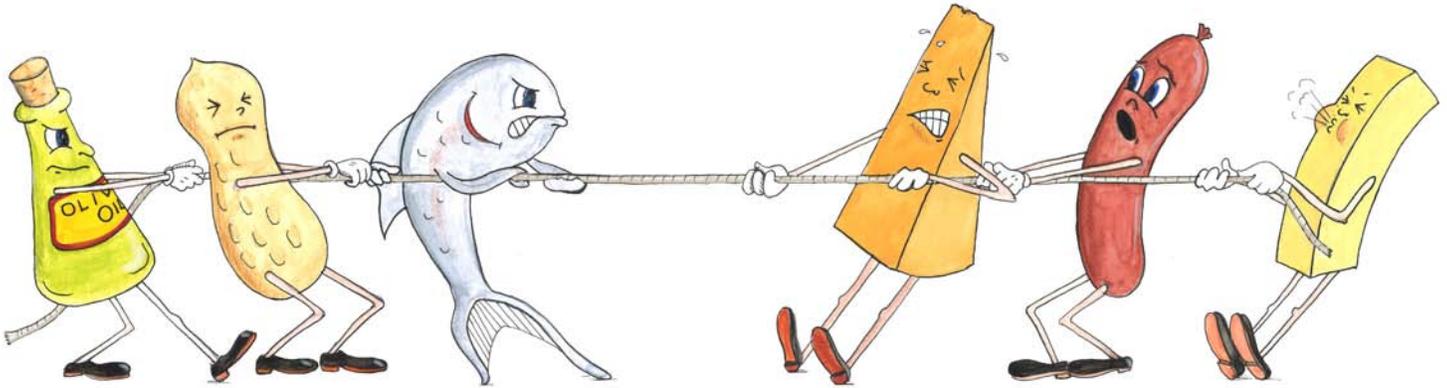
In March 2014, an article appeared in the *Annals of Internal Medicine* that sent the food-obsessed public into gastronomic raptures. Though saddled with a drab title—“Association of Dietary, Circulating and Supplement Fatty Acids with Coronary Risk”—the article reported a seemingly stunning result: eating less saturated fat, the dietary demon that makes buttery croissants so irresistible, doesn’t actually lower a person’s risk for heart disease.

The finding was reported widely in the media, hitting all the cultural hot buttons: food and fat, death and disease, bacon and Brie. As Mark Bittman’s column in *The New York Times* rhapsodized: “Butter is Back. Julia Child, goddess of fat, is beaming somewhere.”

The *Annals* article, and the subsequent news coverage, set off a national conversation about dietary fat. Indeed, there is debate within the scientific community itself over how important it is to focus on certain types of dietary fat—and that debate existed long before the *Annals* article appeared. The debate exists even among professional colleagues—and friends—within Harvard School of Public Health’s Department of Nutrition.

But there are also broad areas of continuing agreement around what constitutes a “healthy diet.” The consensus: We all need to shift our collective nutritional thinking toward an emphasis on food-based, rather than nutrient-based, recommendations. The fact is, not all fats are bad, and concentrating too much on eliminating “fat” from our diets has, in many cases, led us to replace even healthy fats with sugars and other simple carbohydrate foods that may actually be worse for our health.

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FAT WARS: A SHORT HISTORY

It's hard to pinpoint exactly when fat started to become the enemy on our plate, but a good guess may be January 13, 1961. On that day, a University of Minnesota physiologist named Ancel Keys appeared on the cover of *Time* magazine, glowering at the gluttonous American public through horn-rimmed glasses.

Keys had made a name for himself during World War II by developing the K ration, and after the war turned his attention to the relationship between diet and health, particularly heart disease. He actually spent several years after World War II at HSPH examining this thorny problem. Then, as now, heart disease was the leading cause of death in America, but nobody knew exactly why. Keys led the seminal Seven Countries Study, which for the first

Keys delivered his opinions with the force of fact. (Obesity? “Disgusting,” he said. “Maybe if the idea got around again that obesity was immoral, the fat man would start to think.”) He found that nations where people ate lots of saturated fat—think of the Finns smearing butter on their cheese—suffered higher rates of heart disease. Keys’ work also suggested that diets high in saturated fat and cholesterol increased total cholesterol levels.

Yet based on the well-recognized limitations of cross-country studies, Keys was smart enough to conclude that this early evidence did not prove cause and effect, but rather suggested a need for further research, especially in cohort studies examining individuals within populations. Indeed, many better-designed studies have since proven that total dietary fat has no effect on heart disease.

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time documented that the incidence and mortality rates of coronary heart disease varied as much as tenfold among countries, with the lowest rates in Crete. The study, which began in the 1950s, continues even today.

Keys’ work provided some hints about the culprit behind this yawning gap. He found that saturated fat consumption was strongly associated with regional rates of heart disease, but that total fat intake was not. Indeed, total fat intake in Crete was just as high as in Finland, which had the highest rates of heart disease at that time. Keys suggested that it was the type of fat, as well as the Mediterranean diet in general, that spelled the difference in heart disease risk.

Numerous other investigations building on Keys’ work focused on specific types of fat. Scientists fed monkeys diets high in saturated fat and watched them develop atherosclerosis. Researchers in Finland fed butter to patients in one mental hospital, while those in another got soybean oil—and the patients eating the vegetable oil had a lower risk of heart attack. On the other hand, several other trials around that time replaced butter and other saturated fats with vegetable oils and saw no significant benefits. In a recent study conducted in Spain, scientists gave subjects a free supply of either olive oil or mixed nuts for five years and watched both groups’ risk of heart disease drop.

Epidemiologists established large investigations like the Framingham Heart Study, monitoring people's health for years. Decades passed; data accumulated.

Keys also conducted controlled feeding studies, in parallel with the HSPH Department of Nutrition's Mark Hegsted, which showed that polyunsaturated fats (the kind found just in plants) reduced blood cholesterol levels. This led to recommendations to replace saturated fat with polyunsaturated fat—a trend that some scientists believe has been responsible for significant declines in rates of cardiovascular mortality in the United States.

VERDICT: NOT ALL FATS ARE BAD

By the 1970s, Keys and Hegsted, among other scientists, concluded that different types of dietary fat had varying effects on blood cholesterol levels, and that different types of cholesterol had varying effects on heart disease. Unsaturated fats, especially polyunsaturated fatty acids like those in walnuts, decrease the “bad” LDL cholesterol and raise the “good” HDL cholesterol. In the early 1990s, Walter Willett, now chair of the HSPH Department of Nutrition, and others determined that trans fats—liquid vegetable oils transformed into shelf-stable solids (think Crisco)—were associated with greater risk of heart disease and are a double metabolic whammy, raising “bad” LDL and decreasing “good” HDL. Scientists around the world

simultaneously showed that saturated fat—the kind in butter and lard—increases both “bad” LDL cholesterol and “good” HDL cholesterol, making it similar to carbohydrates overall but not as beneficial to health as polyunsaturated fats from nuts and vegetables.

A COMPLICATED MESSAGE GETS OVERSIMPLIFIED

Unfortunately, amid all these nuanced research results, during the 1980s and 1990s conventional wisdom and national guidelines in the U.S. shifted the spotlight to reducing total fat—period—despite little or no evidence that this simplistic advice would prevent disease.

The complicated message—that some fats are good for you and others are bad—didn't reach the general public. Instead, doctors and scientists running the National Heart, Lung and Blood Institute's National Cholesterol Education Program in the mid-1980s decided to simplify it, explains Lilian Cheung, director of health promotion and communication in the HSPH Department of Nutrition. “They thought of a shortcut: Just cut down fat.”

In 1987, the Henry J. Kaiser Family Foundation launched a social marketing campaign called Project LEAN (Low-Fat Eating for America Now), encouraging Americans to reduce total fat intake to 30 percent of their diet, and spreading the message through advertising and supermarket promotions. The public ate it up, so to speak.

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The Latest Line on Fats



Food rich in mono- and polyunsaturated fats (like olive oil, soybean oil, peanut oil, and canola oil) will lower your heart disease risk. Foods high in saturated fats (such as lard and animal fats like well-marbled meat) will not lower heart disease risk, and much research indicates they increase your risk of heart disease.



Don't replace foods rich in saturated fats with processed foods rich in refined carbohydrates (such as white bread and pastry).



Choose minimally processed foods with healthy fats—including nuts such as walnuts and peanuts, and fish such as salmon.

“There’s a simplistic, intuitive appeal to that message: ‘Fat has more calories per gram, so if I eat fat, I’ll get fat,’” says Willett. The food industry jumped on board, removing fat from food and replacing it with sugar and carbohydrates, filling supermarket shelves with fat-free salad dressing, fat-free ice cream, and low-fat SnackWell’s cookies.

“FAT-FREE” MESSAGE A PUBLIC HEALTH DISASTER

It was one big, happy, fat-free feeding frenzy—and a public health disaster.

“We didn’t know as much then about the bad effects of refined carbohydrates,” says Cheung. “For example, low-fat yogurt is loaded with sugar. Our bodies digest these

“This was really a paradigm shift in terms of the fat message,” says Hu. “Not all fats are created equal.” Dariush Mozaffarian, newly named dean of the Friedman School of Nutrition at Tufts University, notes that in 2005, an updated report from the Nurses’ Health Study by Hu and other HSPH researchers showed that neither overall fat, saturated fat, nor monounsaturated fat intake was linked to heart disease. Polyunsaturated fat intake, however, was found to be clearly protective.

Unfortunately, by the time Frank Hu’s first study made the front page of the *Times* in 1997, our anti-fat bias had become entrenched. Perversely, the low-fat message helped feed America’s obesity epidemic, as carbohydrates replaced

“Instead of emphasizing one nutrient, we need to move to food-based recommendations. What we eat should be whole, minimally processed, nutritious food—food that is in many cases as close to its natural form as possible.”

—Dariush Mozaffarian, dean of the Friedman School of Nutrition, Tufts University and HSPH adjunct associate professor of epidemiology

refined carbohydrates and starches very quickly, causing an insulin spike.” Insulin tells the body to store fat and causes our blood sugar to drop, which makes us feel hungry. These relentless sugar highs and lows lead to overeating and weight gain, raising the risk for heart disease and diabetes.

In 1997, HSPH’s Frank Hu—at the time a postdoctoral fellow at HSPH, now professor of nutrition and epidemiology—published a landmark epidemiological study in the *New England Journal of Medicine*. Hu’s report told a more subtle story about dietary fat and heart disease. His data, collected from 80,082 women enrolled in the long-running Nurses’ Health Study—a collaboration by HSPH, Harvard Medical School, and Brigham and Women’s Hospital—suggested that replacing a mere 5 percent of saturated fat calories with unsaturated fat would reduce one’s risk of heart disease by a whopping 42 percent. Replacing only 2 percent of trans-fat calories (the kind found in packaged pastries) with unsaturated fat would reduce one’s risk of heart disease by 53 percent. In other words, it wasn’t total fat that mattered, but type of fat.

The discovery was so surprising that *The New York Times* splashed it on Page 1.

fat in many foods to make them “low-fat” or “no-fat” but still tasty to American and global palates.

A DIFFERENCE OF OPINION

It was against this backdrop that the 2014 *Annals of Internal Medicine* study created such a stir. The article discussed the results of a “meta-analysis,” a type of statistical analysis that gathers data from many different studies and crunches them together. Hu first learned of the *Annals* meta-analysis a few days before it was published, when *The New York Times* sent him a copy and asked for comment. At the same time, Willett got a call from an NPR reporter questioning the study’s results, especially the conclusion that eating more polyunsaturated fat failed to lower the risk for heart disease.

“I knew something was fishy,” says Willett. He requested a data supplement from the journal and noticed that the authors had pulled incorrect numbers from some of the original studies, including the long-running Nurses’ Health Study, which Willett helps direct. Willett also saw what seemed to him to be another problem: the authors had omitted important studies from their analysis. Adding to the complications: One of the study’s authors was a respected

What **SHOULD** We Worry About?

HERE'S WHAT NUTRITIONISTS INTERVIEWED FOR THIS STORY AGREE ON:

EAT **LESS**



Processed meats and cold cuts



Processed snacks that are low in fat but high in sugar and refined carbohydrates



Diets high in sodium

EAT **MORE**



Diets high in fruits, vegetables, nuts, seeds, whole grains



Diets high in omega-3 fatty acids, which are found in seafood

Adapted from talk given by Dariush Mozaffarian, April 25, 2014

colleague in HSPH's Department of Nutrition: Mozaffarian, who was then still an associate professor at the School.

As Willett and Hu saw it, the glaring problem in the article was one of the findings: that replacing saturated fat with polyunsaturated fat does not necessarily reduce your risk for heart disease. According to Willett, "People don't just remove saturated fat from their diets. They replace it with something else." And this replacement, also called a "comparator," can make all the difference. Exchanging a hot buttered cheesesteak for a half-dozen doughnuts does not help your heart; swapping it for grilled salmon with greens and olive oil does. That's the full message. But Willett quickly realized that the full message of replacement was complex and not likely to make it into news media reports.

Willett contacted the journal editor. "I knew this was going to cause huge confusion," he recalls. With HSPH colleagues, Willett scrambled to write a response to *Annals* and sent it to the journal before the paper was published. The journal posted their letter online several days after publication and, subsequently, a version of the article in which some of the specific errors were corrected.

Mozaffarian, a co-author on the paper, agrees with Willett and Hu that eating polyunsaturated fat reduces the risk of heart disease. He believes that the evidence indicates that, compared to the average diet consumed by

Americans, polyunsaturated fat is more beneficial to heart health than any other major macronutrient. Saturated fat, on the other hand, turns out to be neutral from a heart health perspective when compared to the average diet—so that campaigns which prioritize reducing saturated fat consumption, rather than focusing on foods and overall diet quality, are a misplaced and misleading public health strategy.

He adds: "Frank Hu had published nearly identical findings in 2010 in the *American Journal of Clinical Nutrition*, demonstrating that people who eat the highest levels of saturated fat have the same risk of heart disease as those who eat the lowest."

THE MEDIA MESSAGE

Willett felt that his efforts to provide clarification and context came too late to enable the media to uniformly provide the nuanced reporting this new study required. Some reporters covered the issue with context and balance. Others merely reprised the lead from the original tip sheet for news reporters from the *Annals*, headlined: "Evidence does not support guidelines on fatty acid consumption to reduce coronary risk."

Emanuele Di Angelantonio, a university lecturer in the Cardiovascular Epidemiology Unit at the University

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of Cambridge, who was the senior author on the *Annals* study, was surprised at how the message got distorted. “It was reported as ‘butter and burgers,’ and that’s not what our paper said,” he notes. “What the paper said was that the story on saturated fat is slightly more complicated than we thought.”

In July 2014, Di Angelantonio published a detailed response to scientists’ criticisms. In the letter, he did not change any conclusion, but added additional context. “Our paper summarizes the evidence so scientists can plan future research,” he says.

“I sympathize with the press’s predicament, because they’re not experts in this,” says Frank Sacks, professor of cardiovascular disease prevention in the HSPH Department of Nutrition. “They see a well-known medical journal publishing a meta-analysis and pronouncing a very important result that goes against our current guidelines. So I don’t

In other words, the problem isn’t just what we eat, but also how we think about food. We fixate on the nutrient of the day, even those that confer benefits (Lycopene to prevent cancer! Phytoflavonoids to fight inflammation!); we eat mindlessly in the car and in front of the TV; we value volume of food over the quality of the ingredients, the beauty of presentation, and even taste.

Researchers say we should focus on healthy dietary patterns, rather than glorify or demonize specific nutrients. A healthy pattern includes heaps of fresh fruits and vegetables, whole grains, nuts, legumes, poultry, and fish. An unhealthy but all-too-frequent pattern: piles of processed meat, mounds of french fries, lots of white bread and potatoes and processed breakfast cereals, giant sugary drinks, and packaged cupcakes for dessert.

“Food is about enjoyment and nourishment to the body as well as the soul,” says Cheung. In her view, the goal isn’t

“People don’t just remove saturated fat from their diets. They replace it with something else,” says Walter Willett, chair of the HSPH Department of Nutrition. Exchanging a hot buttered cheesesteak for a half-dozen donuts does not help your heart; swapping it for grilled salmon with greens and olive oil does.

feel the press really should be expected to understand the science at the level that it would take to critique the study. On the other hand, things like this are very attractive to the press, because everybody is interested in it. It’s a story.”

FOCUSING ON FOODS, NOT NUTRIENTS

But there’s a deeper issue beyond the recent media ruckus, explains Mozaffarian. “The findings demonstrate that, in practice, when people lower their saturated fat intake, they don’t necessarily eat healthier diets. Saturated fat is found in a range of foods—including not only butter and meats but also milk, yogurt, cheese, nuts, and vegetable oils. Each of these foods has different effects on heart disease. Instead of emphasizing one nutrient, we need to move to food-based recommendations. We’re not going to artificially create healthy diets by manufacturing low-fat, low-saturated-fat packaged foods. What we eat should be whole, minimally processed, nutritious food—food that is in many cases as close to its natural form as possible.”

to be grimly disciplined or morally virtuous, but rather to be mindful when negotiating today’s dazzling cornucopia. “Choose what you eat mindfully and enjoy,” she says. “Be aware and sensible about your choices, because it’s your health and well-being.”

THE BOTTOM LINE

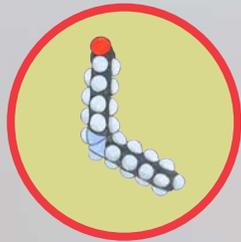
Complicated questions about diet and health require evidence from many different types of studies over many years before the weight of evidence shifts toward consensus.

In the case of dietary fat, most scientists do agree on a number of points. First, eating foods rich in polyunsaturated fat will reduce the risk of heart disease and prevent insulin resistance. Second, replacing saturated fat with refined carbohydrates will not reduce heart disease risk. Third, olive oil, canola oil, and soybean oil are good for you—as are nuts (especially walnuts), which, while they include some saturated fat, are also high in unsaturated

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a primer on **FATS**

All fats have the same basic chemical structure: a molecule of glycerol (a simple sugar alcohol) bound to three long chains of carbon atoms. If each carbon is holding as many hydrogen atoms as it can, then the fat is “saturated” and the carbons form a long, straight chain. Unsaturated fats have one or more double bonds, which cause kinks in the carbon chain. The shape of the carbon chain helps determine the properties of the fat and how it interacts with cells. All foods contain a mix of fat types, but one type usually predominates.

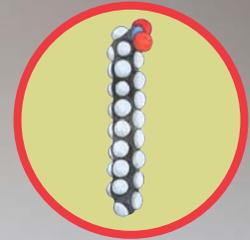


UNSATURATED FAT

Examples: Vegetable oils, nuts, fish (animal fats also contain modest amounts of monounsaturated fat)

There are two types of unsaturated fats: mono and poly. Monounsaturated fats have one double bond in the carbon chain; polyunsaturated fats have between two and six. These double bonds change the shape of the molecule, adding bends and kinks that cell membrane receptors can recognize. Our bodies cannot make essential polyunsaturated fats (alpha-linolenic acid and linolenic acid from plants or plant oils), so we have to eat them.

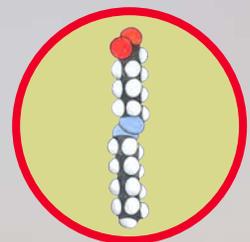
Polyunsaturated fats trigger mechanisms in the liver for removing cholesterol from the body. First they activate LDL receptors, which pull “bad” LDL cholesterol from the bloodstream. Then they trigger the liver to excrete cholesterol in the bile, rather than dump it back into the bloodstream.



SATURATED FAT

Examples: butter, lard, bacon grease, dairy fat

Because saturated fats contain straight chains of carbon, the molecules are able to pack closely together and cling tightly to one another. This makes them very effective for energy storage (i.e., high in calories). Saturated fats raise the total blood cholesterol by raising the harmful LDL (low-density lipoprotein), but they also raise beneficial HDL (high-density lipoprotein) in comparison to carbohydrates, although researchers dispute how helpful this increase is.



TRANS FAT

Examples: partially hydrogenated oils such as traditional Crisco, which until recently were found in many packaged baked goods and other processed snacks.

In food production, hydrogen atoms are forced onto the carbon chains of liquid unsaturated fats, turning them into solid saturated fats. This is how cottonseed oil is transformed into Crisco, and it’s useful for making shelf-stable snacks.

The rigid structure of trans fats causes them to interact differently with cell membranes, telling the body to make more LDL and excrete less. Trans fats also suppress the production of “good” HDL cholesterol.

What's for Lunch?

We asked four nutrition experts to describe an ideal meal. Here's what they said:



WALTER WILLETT

MEAL: Quinoa with mixed vegetables, prepared with olive oil, broccolini sautéed with a little bit of garlic and olive oil, and nuts. I often eat these with fish or tofu. If I'm in a hurry, I may just grab some whole wheat bread and peanut butter with low-sugar blueberry jam.

DRINK: Tea or coffee.

DESSERT: An apple and maybe a bit of plain yogurt.



LILIAN CHEUNG

MEAL: I love tofu and cut it up on a plate of mixed vegetables. I love sage, which I cut up very fine. I add olive oil plus balsamic vinegar dressing, some nuts, sometimes sesame seeds.

DRINK: Coffee or tea. I use soy milk because I'm allergic to dairy—and I love to put a teaspoon of honey in it.





FRANK HU

MEAL: I'm rediscovering some of the ancient grains, like quinoa and freekeh. I have a generous amount of vegetables. And I put nuts in everything, basically. We eat fish at least three or four times a week, and some poultry.

DRINK: I used to drink tea, but now I drink three or four cups of coffee per day, because we have found more and more evidence that coffee is good for you. And, of course, water is always good.

DESSERT: Fruits. I like different varieties.



DARIUSH MOZAFFARIAN

MEAL: Salmon, fresh berries, grilled asparagus with extra-virgin olive oil, some slivered almonds on top.

DRINK: Seltzer water with ice.

DESSERT: Dark chocolate. I eat dark chocolate every day.



The Lure of Meta-Analysis

The 2014 *Annals of Internal Medicine* study on saturated fat raised questions about the growing use of meta-analyses in scientific research. Having first gained popularity among social scientists in the 1980s, meta-analyses are useful for discerning patterns or trends and offering a big-picture view of the science on a particular subject. “They’re most exciting if there’s a public policy issue and there are studies that could inform the issue,” says Nan Laird, HSPH professor of biostatistics. “As a public, we’re really tired of hearing news story x and news story y and news story z. So it’s attractive to say, ‘Hey, we’ve put everything together and here’s the answer.’”

Scientists investigating nutrition have several ways to conduct their initial research. They can follow a large group of people for a while, take notes on what the volunteers eat, and see what happens to the group (a prospective cohort study). They can gather people with a specific disease, such as type 2 diabetes, and see what dietary habits those individuals have in common (a retrospective cohort study). They can totally control people’s diet for a time and see what happens (a feeding study). Or they can go for the “gold standard”: a randomized, double-blind, placebo-controlled study. In this type of research, subjects are randomly assigned to two groups, one of which receives the food or drug under study, while the other receives a placebo. Neither the subjects nor the scientists know who is in the active or control group.

Each type of study has advantages and disadvantages. A randomized, double-blind, placebo-controlled study is easy to do if you are giving people a round white pill to lower cholesterol—but more complicated if you want to test the merits of eating, say, salmon vs. beef. Feeding studies yield exquisite data—but are expensive and difficult. Cohort studies can extend for decades and suggest many links between diet and disease—but the conclusions may be muddled by many other factors.

Overcoming these problems is the attraction of meta-analyses, which combine data from all these types of studies to give the big picture. Or at least, that’s what they are supposed to do.

So, **IS** Butter Really Back?

WALTER WILLETT:

“Butter is not back. Long term health will be better with olive and other oils (sorry, Julia).”



DARIUSH MOZAFFARIAN:

“Definitely not. Although saturated fat content is unhelpful for judging foods, people should prioritize those foods that we know improve health, and butter is not one of them.”



fat, tipping the balance in their favor. Finally, omega-3 and omega-6 fatty acids are essential for many biological processes—from building healthy cells to maintaining brain and nerve function—and we should eat a variety of healthy foods, such as fish, nuts, seeds, and vegetable oils, to obtain adequate amounts of both fatty acids.

Other, finer points are still unclear. For instance, monounsaturated fat is believed to lower risk for heart disease. But it’s difficult to study in Western populations, because most people get their monounsaturated fat from meat and dairy, which are also full of saturated fat. Still, people can choose from a variety of monounsaturated-fat-rich foods, such as peanuts and most tree nuts, avocados, and, of course, olive oil. And though scientists agree that omega-3 and omega-6 fatty acids are essential, they debate how much of each we actually need.

While meta-analyses are relatively inexpensive, they require meticulous effort to find the original literature, distill the data, and combine them meaningfully. “It’s not like there’s a magic statistical crank that can be turned that suddenly turns mush into enlightenment,” says Laird. “It’s a big, complicated issue.”

In addition, because meta-analyses strive to be comprehensive, they tend to attract media attention. For this reason, Willett and others argue, scientists must take extra care with them and should possess a deep understanding of the original data.

Willett had taken a similarly strong stand against a meta-analysis published in the *Journal of the American Medical Association (JAMA)* in 2012, which reported that overweight people were 6 percent less likely to die than those of normal weight. Willett says the analysis did not properly account for factors like the tendency of frail elderly people to lose weight (not healthy), smokers to be skinny (also not healthy), and people with serious diseases to lose weight before they die.

Willett also noted that the National Cancer Institute, partly in response to the *JAMA* paper, later sponsored a pooled analysis on the same subject. A pooled analysis, in which scientists gather raw data directly from the source rather than using data summaries from published papers, is more time-consuming and expensive than a meta-analysis, but the results can be more meaningful. The study, published in the *New England Journal of Medicine*, said that being overweight was indeed deleterious. According to Willett, it got almost no press.

Similarly, an international collaboration of investigators had examined the relationship between type of fat and coronary heart disease—the same topic of the recent meta-analysis—by combining the original data from large cohort studies (more studies than in the recent *Annals* meta-analysis). Because they had access to the original data collected on individuals, the researchers were able to compare calories from saturated fat with the same number of calories from carbohydrates (which showed no difference in risk) and from polyunsaturated fat (which showed lower risk). They, too, received virtually no media attention.

While the public may find such uncertainty disconcerting, there are always unknowns at the forward edge of science. And scientists will sometimes disagree—even when they work at the same institution, as Willett and Mozaffarian demonstrate. Much as we’d prefer clear-cut answers, pure and simple truths, they are not always easy to come by.

“There’s a lot of uncertainty in data. And it’s the job of those of us who work in science to try and simplify answers as much as possible,” says Nan Laird, Harvey V. Fineberg Professor of Public Health and professor of biostatistics at HSPH. “But you don’t want to lose the accurate representation. And an accurate representation may be that we don’t really know the answer. That’s not something that people necessarily want to hear.”

Compounding the problem is the fact that dietary advice, even from august bodies like the National

Institutes of Health (NIH), can lag the scientific evidence. The NIH takes years to adopt new guidelines, and astoundingly is still stuck on a low-fat, high-carb message, say HSPH researchers. The NIH’s Healthy Cooking and Snacking website suggests snacks to children and families like fat-free cheese on crackers and fat-free chocolate milk. The agency’s “GO, SLOW, and WHOA” food chart labels avocado and olive oil as “sometimes” foods, while ketchup and fat-free creamy salad dressing as “almost anytime” foods.

“It’s absurd. It’s still completely focused on lowering total fat,” says Mozaffarian. “We need to bridge the gap between scientific consensus and current policy.”

Barbara Moran is a science writer based in Brookline, Massachusetts.