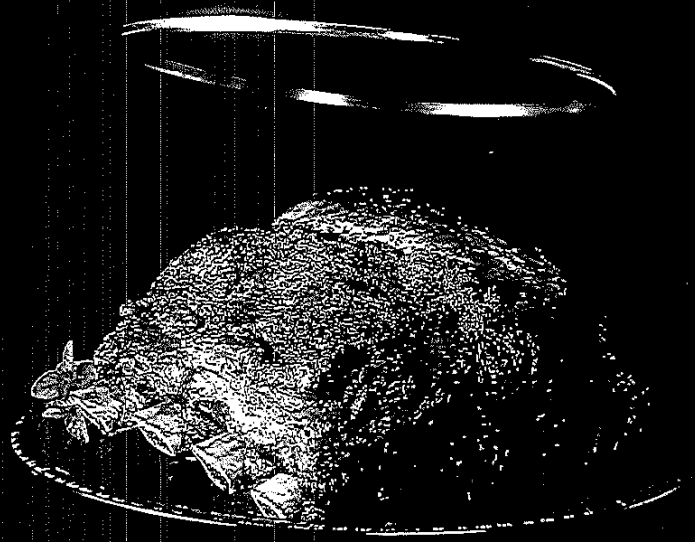
NEW YORK TIMES BESTSELLER

"A page-turner . . . A gripping read for anyone who has ever tried to eat healthily." —*The Economist*



# THE BIG FAT SURPRISE

## Why Butter, Meat & Cheese Belong in a Healthy Diet

NINA TEICHOLZ

# Contents



Chapter 7:

What follows are selected pages from an important book.

Regards, Rory

# THE BIG FAT SURPRISE

## Why Butter, Meat, and Cheese Belong in a Healthy Diet

NINA TEICHOLZ

SIMON & SCHUSTER PAPERBACKS

New York London Toronto Sydney New Delhi

2014

PRAISE FOR *THE BIG FAT SURPRISE*

"[Teicholz] has a gift for translating complex data into an engaging forensic narrative. . . . [*The Big Fat Surprise*] is a lacerating indictment of Big Public Health. . . . More than a book about food and health or even hubris; it is a tragedy for our information age. From the very beginning, we had the statistical means to understand why things did not add up; we had a boatload of Cassandras, a chorus of warnings; but they were ignored, castigated, suppressed. We had our big fat villain, and we still do."

—*The Wall Street Journal*

"Ms. Teicholz's book is a gripping read for anyone who has ever tried to eat healthily. . . . This is not an obvious page-turner. But it is. . . . The vilification of fat, argues Ms. Teicholz, does not stand up to closer examination. She pokes holes in famous pieces of research—the Framingham heart study, the Seven Countries study, the Los Angeles Veterans Trial, to name a few—describing methodological problems or overlooked results, until the foundations of this nutritional advice look increasingly shaky."

—*The Economist*

"Teicholz's book shows that not only are foods rich in saturated fat not harmful to our hearts, but they actually are good for us. . . . Read Teicholz's excellent book and tell me you aren't convinced she's right."

—*Chicago Sun-Times*

"A devastating new book . . . [*The Big Fat Surprise*] shows that the low-fat craze was based on flimsy evidence. Nina Teicholz, an experienced journalist who spent eight years tracking down all the evidence for and against the advice to eat low-fat diets, finds that it was based on flimsy evidence, supported by an intolerant consensus backed by vested interests and amplified by a docile press."

—*The Times of London*

"A wonderful book [that] takes on everything we think we know about nutrition."

—Ruth Reichl, interview in *The Boston Globe*

# 7

# Selling the Mediterranean Diet: What Is the Science?

The Mediterranean diet is now so famous and celebrated that it barely needs introduction. The regime recommends getting most of the body's energy from vegetables, fruits, legumes, and whole grains. Seafood or poultry may be eaten several times a week, along with moderate amounts of yogurt, nuts, eggs, and cheese, while red meat is allowed only rarely, and milk, never. Its main novelty for Americans was the introduction of olive oil, which it advised in abundance. It's been a tasty and well-loved diet in the United States, the subject of hundreds of cookbooks, and more media coverage than a movie star. In recent studies, it has also been shown to be healthier in every way than the low-fat diet. But is the Mediterranean diet really the nutritional ideal, the savior its champions claim it to be?

Of course the diet with a small "d"—the one of bread and branzino eaten by many of the Mediterranean peoples themselves—has obviously existed in Greece, Italy, and Spain for many years, but the Mediterranean Diet with a capital "D," the nutritional concept and program that has been endorsed worldwide by scientists and government bodies alike, didn't really exist before the nutrition experts themselves invented it.



That capital "D" diet began to be developed in the mid-1980s by two smart and ambitious scientists, one from Italy and one from Greece, who took the important first step of establishing the hypothesis that the traditional fare of their homelands might protect against obesity and heart disease. One of these researchers was Antonia Trichopoulou, a professor at the University of Athens Medical School, who is widely known as the "Godmother" of the Mediterranean Diet for having done more than anyone else to shepherd it to global prominence. The idea had a simple origin, she explains. As a young medical doctor working at the hospital of the University of Athens Medical School, Trichopoulou was advising her patients with high cholesterol to eat various vegetable oils, since that was what the WHO, following in the footsteps of the AHA, had been recommending as a way to steer clear of saturated fats in the fight against heart disease.

**Antonia Trichopoulou**

Antonia Trichopoulou, the Greek founder of the "Mediterranean Diet." She felt compelled to act when she saw olive trees being cut down and a traditional way of life disappearing.

Trichopoulou didn't question these dietary precepts until "One day, a very poor man came to the hospital," she explained. "And he said, 'Doctor, they are telling me to eat vegetable oil, but I'm used to olive oil! I cannot eat that!' " Trichopoulou knew that many Greeks still drizzled olive oil over

everything, and she respected its traditional place in Greek cuisine going back perhaps thousands of years. Many Greek families still cultivated small plots of olive trees in their backyards to make their own oil. Yet due to the global influence of US-led nutrition policy, which favored polyunsaturated oils such as corn, safflower, and soybean, the consumption of olive oil in Greece was dropping. "We had started cutting down olive trees," lamented Trichopoulou. Given the oil's pedigree in Greek culture, Trichopoulou wondered if it could be any less healthy than the vegetable oils she had been promoting. She had an intuitive sense that something so intertwined in Greek history could not be wrong.

And she asked herself a broader question: Might olive oil not be just one element in a tapestry of Greek dietary traditions that altogether protected against disease? This diet could perhaps explain why, in the 1950s when she was young, the Greeks were found to be second only to the Danish in their life expectancy (among countries with similar statistics, at least). Trichopoulou wondered if she could quantify what her fellow Greeks were eating back then. Researching the topic, she came across the famous Seven Countries study by Ancel Keys, which was a rich source of dietary data for Greece and Italy during those mid-twentieth century years.

Keys had been drawn to Mediterranean countries, of course, because they seemed to be compatible with his hypothesis that saturated fat caused heart disease. The men he had studied during his first trip to the region in 1953 had very low rates of heart disease, and appeared not to eat much meat. Keys was particularly drawn to the island of Crete, because the Greeks living there were reputed to be especially long-lived. When he first visited, he was amazed "to see men of 80 to 100 and more going off to work in the fields with a hoe." To Keys, whose own countrymen were dropping like flies from heart attacks in middle age, the Cretans appeared like some miracle superbreed.

How poetic, too, that Greece, the ancient cradle of art, philosophy, and democracy, might also give to mankind the platonic ideal of a healthy diet! It all seemed to fall into place, with the beautiful, mythic island of Crete coming to radiate a kind of wonderment for Keys and his team. Just the weather alone was a welcome break for Keys, who marveled at his good luck in leaving behind his post as a visiting professor at Oxford University, enduring



Britain's "age of austerity" after the war. "We were freezing in our unheated house and were tired of food rationing," he wrote. As he and his wife, Margaret, drove through Europe, he experienced sheer relief upon leaving the frigid cold of the north for the sunny plazas of southern Italy: "All the way to Switzerland we drove in a snowstorm. . . . On the Italian side the air was mild, the flowers were gay, birds were singing, and we basked at the outdoor table drinking our first espresso coffee at Domodossola. We felt warm all over."

Anyone who has traveled to Italy will instantly recognize this swoon for the warmth, the beauty, the people. And the food! Keys recalled their delight in dining: "Homemade minestrone" and pasta in endless variety, "served with tomato sauce and a sprinkle of cheese," bread fresh out of the oven and "great quantities of fresh vegetables; . . . wine of the type we used to call 'Dago Red,' " and always fresh fruit for dessert. Eventually, Keys built a second home for himself in Italy, a large villa on a cliff overlooking the sea just south of Naples. "Mountains behind and the sea in front, all bathed in shimmering sunshine—that is the Mediterranean to us," he wrote.

**Ancel Keys and Colleagues**
**Touring the Archeological Site of Knossos**

Ancel Keys and colleagues on Crete; the data from their nutritional research on that island became the foundation of the Mediterranean Diet. Ancel Keys is at the center. To the far right is Christos Aravanis, who directed the Greek portion of the Seven Countries study. To the left, with white hair, is Paul Dudley White. The man speaking is a guide.

"France and Spain ate twice as many potatoes than Greece," he wrote, and "the French ate much more butter."* Meat and dairy were consumed much less frequently in southern countries than in the North. Indeed, everywhere in the region he looked, there were differences in the amount and type of dairy consumption, the amount and type of meat, the amount and type of vegetables and nuts—pretty much everything.

**Anna Ferro-Luzzi**

The Italian founder of the "Mediterranean Diet" in Italy, Ferro-Luzzi still questions if it can ever be defined properly.

In a meticulous, landmark paper in 1989, Ferro-Luzzi tried to create a workable definition of the nutritional patterns characterizing European countries bordering the Mediterranean Sea. Hers was the most rigorous attempt ever made, but ultimately she concluded that the project of identifying a Mediterranean diet was an "impossible enterprise, since data are lacking, incomplete, or too aggregated." The all-embracing term "Mediterranean diet," "while very attractive," she wrote, "should not be used in scientific literature, until its composition, both in foods, nutrients and non-nutrients, is more clearly defined."

*Keys took a Europe-centered view of the Mediterranean. He focused on Italy, Greece, France, Spain, and Yugoslavia, and did not mention the African and Middle Eastern countries bordering the Mediterranean Sea, which have on the whole been excluded from the Mediterranean diet literature.



Despite these obstacles, however, Ferro-Luzzi still thought that modern-day, highly processed foods were obviously worse for health, and so she worked assiduously to preserve the traditional cuisine of her homeland. The Mediterranean Diet was a tough sell in those early years, however, since the concept made little sense to her fellow Italians. They did not think of themselves as having a "diet" of any kind, nor did they want to. Italians simply ate. "And bureaucrats didn't like the idea of 'medicalizing' a diet that had always just been a natural way of life," she explains.

## Abundance of Olive Oil Confronts the Low-Fat Diet

The fact that the efforts of these two women would eventually lead to the Mediterranean diet being hailed around the world and even granted special status for its "intangible cultural heritage,"* as UNESCO did in 2010, did not seem obvious in these early, scrappy years. Various problems, both political and scientific, seemed likely to prevent the diet from ever attaining the hopes of its early supporters. On the scientific front, the principal challenge that Ferro-Luzzi had tackled—how such disparate eating patterns across different countries could be corralled under a unified concept—remained unresolved. And the ideological obstacles loomed even larger: The main issue was, how could an olive-oil-drenched diet triumph in a world dominated by low-fat dietary guidelines? This question had been present from the start, when Keys observed that the "healthy" Cretan diet was virtually overflowing with fat, representing between 36 percent and 40 percent of daily calories. The fat in question was olive oil, of course: the vegetables, he wrote, were served literally "swimming in oil."

As Ferro-Luzzi and Trichopoulou started to convene European re-

*This category of world heritage includes expressions of culture such as mariachi music and wooden movable type in China; the Mediterranean diet is the only nutritional regime on the list.

searchers around the Mediterranean diet idea in the 1980s, most health authorities found the sheer amount of fat in this proposed regime to be more or less preposterous. All that olive oil conflicted with the Western world's dietary guidelines, which limited fat to 20 percent to 30 percent of calories. Mainstream nutrition experts simply could not fathom how these fat-guzzling Greeks could possibly be so healthy. In response to this apparent paradox, Mark Hegsted, the Harvard professor who steered the McGovern committee and then led the USDA to publish its first dietary guidelines, announced, "You can't recommend high-fat diets." That declaration was the sound of the nutrition establishment putting its foot down: it was inconceivable to allow such liberal fat consumption.

In direct opposition to this low-fat monolith, Trichopoulou spearheaded the crusade for the Mediterranean Diet to contain, in its formal definition, 40 percent of calories as fat. This may sound like a relatively high amount, but it's no more than most Western populations ate before adopting the low-fat diet. Trichopoulou, along with other investigators, made a considerable effort to confirm that this 40 percent number was an accurate representation of traditional Greek eating habits. Her research concluded that it was. And she spent even more time fending off the low-fat ideology. "I said this would *destroy* the diet of the region. In Greece, this is the way we have always eaten. You cannot advise less fat!" she told me.

Her most vocal opponent on this score was Ferro-Luzzi, who took the low-fat side of the debate. She knew that in Italy, Keys had found fat consumption to be lower than in Greece, between 22 percent and 27 percent of calories. These numbers aligned more closely with international recommendations and also pertained to her homeland, so naturally she favored them. Ferro-Luzzi also took a magnifying glass to Keys's Greek data expressly to see if she could find some flaw with his 40-percent-fat number. She concluded that his data, like all of those available on the Greek diet of that period, were so scanty and unreliable* that there were "few scientific grounds" for the claim of a traditional Greek diet ever being high in fat.

*Anna Ferro-Luzzi identifies many methodological and technical problems with Keys's data, although she did so reluctantly, she says, since she and Keys were friends (Ferro-Luzzi, interview with author).



Ultimately, focusing so incessantly on total fat as the cause of disease turned out to be myopic and misguided, as we know, but this would not be understood for many years. In the meantime, the vast majority of researchers believed that fat made people fat and caused cancer and heart disease, so experts were worried that the Greek arm of the Mediterranean diet might be seriously unhealthy. Not a conference or meeting could pass without the issue being raised, and no one felt casual about it, least of all Ferro-Luzzi and Trichopoulou. "I had to sit in the middle and stop them from fighting," recalls W. Philip T. James, now chairman of the International Obesity Task Force in the United Kingdom.*

Trichopoulou eventually prevailed for the principal reason that she won over two influential Americans to her way of thinking. It turned out that in the same way that the low-fat diet had been catapulted by Keys into the American mainstream, so, too, would the Mediterranean diet depend upon forceful and influential personalities to make it a success. One of those people was Greg Drescher, a founding member of a group in Cambridge, Massachusetts, called the Oldways Preservation and Exchange Trust, which would go on to become the most vigorous promoter of the Mediterranean diet worldwide, and the other was Walter C. Willett, a professor of epidemiology at the Harvard School of Public Health, who would go on to become one of the most powerful nutrition experts in the world. The lines of causation behind success worked in reverse, too. Like Keys, who rode to fame on the low-fat diet, so, too, would Willett rise to prominence with the Mediterranean one.

Drescher and Willett both traveled to Athens in the late 1980s, where they each spent time with Trichopoulou. She and her husband, Dimitrios, who, like Willett, was also an epidemiologist at Harvard, hosted Willett

*The argument about fat percentages reached a crescendo among researchers in Europe in the year 2000, at the final planning meeting for a project aimed at establishing a single set of nutritional guidelines for the entire European Union. Called Eurodiet, it involved 150 European nutrition experts over two years, and an agreement seemed in sight until "Anna and Antonia started arguing about the percent of fat that was allowable in the diet," recalls Philip James, a key participant. No agreement could be reached, and the entire Eurodiet project collapsed (James, interview; Willett, interview with author, August 3, 2012).

in Athens and took him to a local tavern, where the menu would have included such fare as stuffed grape leaves and spinach pie. For the son of dairy farmers who grew up in Michigan eating what he called "bland American food," these complex and tasty dishes were a revelation. As Trichopoulou remembers, "I showed him that this simple food is what was contributing to longevity in Greece," and she encouraged him to promote this enticing regime for the good health of Americans, too.

Trichopoulou also played a role in Drescher's Mediterranean-food epiphany. Drescher heard her talk at one of her early conferences, "and everyone in the audience, their jaws dropped," he says. They had not yet heard of Keys's still-obscure Cretan cohort, and Trichopoulou was saying that the "Greeks in the sixties were eating so much fat but had no heart disease. How was that possible?!" wondered Drescher, astonished.

"You have to remember that in the late eighties, the reigning voice on health and wellness was Dean Ornish," Drescher explains, referring to the diet guru who counseled Americans to eat as little fat as possible. Drescher had a culinary background, having previously worked with Julia Child and Robert Mondavi. "Those of us in the culinary community were shocked and horrified [by Ornish's rules], because we knew fat was essential to flavor and a good dining experience," he says. "We were depressed about it. Nobody wanted to be a bad person and serve unhealthy food, but we didn't know how to make it all work." Drescher sought to learn more over coffee with Trichopoulou after her speech, and she recommended that he speak to Willett.

Eventually Drescher and Willett joined forces, and the more they learned, the more they realized that a higher-fat diet, with an appealing heart-healthy promise and wrapped in the bewitching beauty of Italy and Greece, could potentially have a strong appeal in America. Together, they were able to move the Mediterranean diet out of its academic-conference backwater and into prime time.*

*The third member of this team was K. Dun Gifford, who had been an aide to both Senator Edward Kennedy and Robert F. Kennedy and then worked in commercial real estate and invested in several restaurants before becoming the founding president of Oldways. Gifford died in 2010.



## The Mediterranean Diet in the United States: Building the Pyramid

Drescher and Willett's first task lay in solving the problem that had bedeviled the diet from the start: how to define it in a coherent way. Working with a team that included Marion Nestle, a professor of food policy at New York University, Elisabet Helsing from the WHO, and Antonia's husband, Dimitrios Trichopoulos, they tried to pin down a diet that was literally all over the map.

"Walter Willett was the pivotal figure," said Drescher. "He provided a needed scientific rigor to the diet."

One of the first steps Willett and his team took involved shrinking the map encompassed in the proposed diet down to a more manageable size. It was decided that the great majority of the region would have to be excluded, either because data were lacking or because these countries—France, Portugal, Spain, and even northern Italy—did not fit the model that had emerged from Crete and southern Italy. Only these two locations shared a more or less similar culinary regime and were largely free of heart disease in the 1960s, so for scientific purposes, Willett's team decided that the Mediterranean Diet should be based on these places alone.

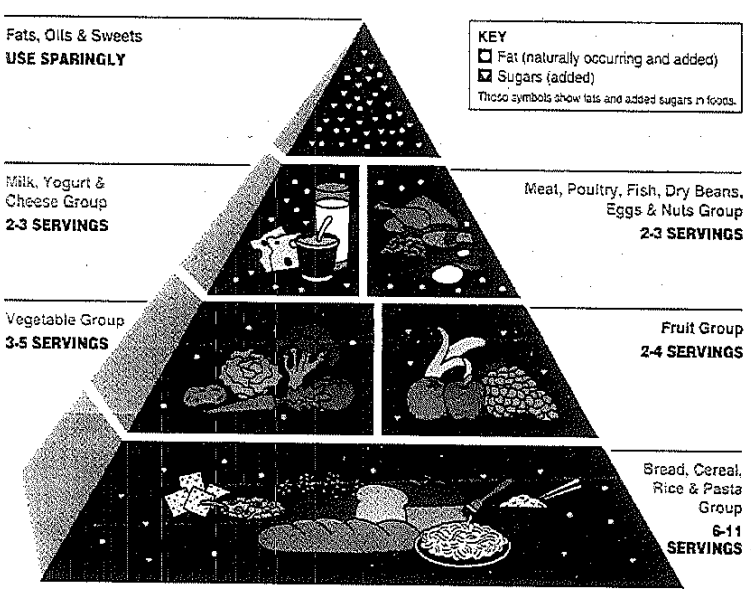
Willett also settled the score on the total amount of fat to be recommended. He was persuaded by Antonia Trichopoulou's 40 percent number because, according to Keys's data, this amount of daily energy from fat was clearly consistent with the relatively good health of these populations. He wasn't a stickler for olive oil, though. Willett advised using vegetable oils, too, since he believed, as nearly all nutrition experts do, that any fat is fine so long as it is an oil, not a solid.

In 1993, one hundred and fifty of the most prominent nutrition experts from Europe and the United States arrived in Cambridge, Massachusetts, for the first major conference on the Mediterranean Diet. Ancel Keys came out of retirement to attend; Anna Ferro-Luzzi, Antonia Trichopoulou, and even Dean Ornish were there. These experts had long lived in a world where diet was defined by atomized nutrients rather than actual foods; no doubt they were expecting the usual slew of dry scientific slides on HDL- and LDL-cholesterol cross-tabulated with various kinds of dietary

fat. Instead, to their delight, over the next few days they were regaled with stories about Italian olive oil and rural life on the islands of Greece.

On the third day, Willett came onstage and unveiled the "Mediterranean Diet Pyramid," to much applause. This pyramid was structurally patterned on the one the USDA had introduced the previous year, and the two pyramids had much in common: the broad middle slab was dedicated to fruits and vegetables, and the giant bottom slab contained grains and potatoes. But for the Mediterranean Diet, some of the other horizontal slices were switched around. Whereas the USDA version put fats and oils, "to be used sparingly," in the pyramid tip, Willett's version gave olive oil a generous middle slab. This was the big news: a high-fat diet was okay! (Willett said his pyramid was an improvement on the USDA's because it had "olive oil poured all over it.") The tip of *his* pyramid pictured red meat,

**USDA Pyramid**



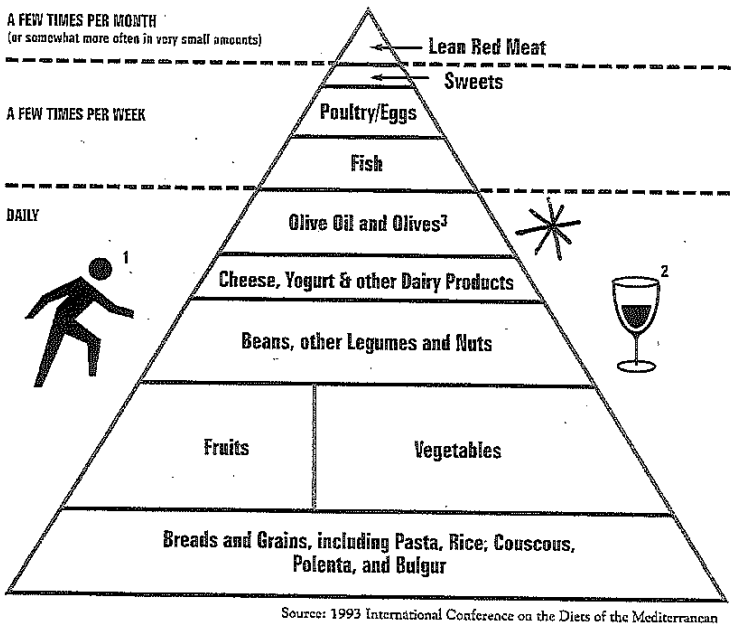

USDA Dietary Guidelines since 1980 have recommended a diet of mainly carbohydrates.



**Mediterranean Diet Pyramid, 1993**

## Optimal Traditional Mediterranean Diet
### Preliminary Concept

This preliminary concept for a pyramid to represent the Optimal Traditional Mediterranean Diet is based on the dietary traditions of Crete circa 1960, structured in light of 1993 nutrition research. Variations of this optimal diet have traditionally existed in other parts of Greece, parts of the Balkan region, parts of Italy, Spain and Portugal, Southern France, North Africa (esp. Morocco and Tunisia), Turkey, as well as parts of the Middle East (esp. Lebanon and Syria). The geography of the diet is closely tied to the traditional areas of olive cultivation in the Mediterranean region. This is intended for discussion purposes only, and is subject to modification.




Source: 1993 International Conference on the Diets of the Mediterranean

[1] Indicates the importance of regular physical activity.

[2] Following Mediterranean tradition, wine can be enjoyed in moderation (1-2 glasses/day) primarily with meals; it should be considered optional and avoided whenever consumption would put the individual or others at risk.

[3] Olive oil, high in monounsaturated fat and rich in antioxidants, is the region's principal fat. In the optimal, traditional Mediterranean diet, total fat can be as high as 35-40% of calories, if saturated fat is at or below 7-8% and polyunsaturated fat ranges from 3-8% with the balance coming from monounsaturated fat (in the form of olive oil). Variations of this diet where total fat (again, principally olive oil) is at or below 30% — such as is found in the traditional diet of Southern Italy — may be equally optimal.

The first Mediterranean Diet pyramid, in 1993, was similar to the USDA's but cut back further on red meat while adding a generous allowance of olive oil.

to be eaten only "a few times a month," less often, even, than sweets. Other proteins (fish, poultry, and eggs) in Willett's model could be eaten only a few times a week, versus a few times a day in the USDA pyramid.

Was this truly a representation of the ideal Mediterranean diet? It was difficult to know. Not everyone at the conference was enamored by the underlying science. Marion Nestle, for instance, had worked closely with Willett in the preparations for the conference but ultimately declined to sign her name to the pyramid. "The science just seemed to me too impressionistic," she told me.

By this, she meant that no scientific evaluation of the diet had been done to justify the proportions of the pyramid's various slices. Remember that Ferro-Luzzi had tried to quantify the diet but found it impossible, and since then, no further efforts had been made. Nor had any clinical trials on the Mediterranean Diet been conducted yet. Therefore, like Keys and his diet-heart hypothesis, the Harvard team conveyed their nutritional idea into the world based on epidemiological data only. The evidence was, scientifically speaking, quite premature, hence Nestle's skepticism. Even one of Willett's former graduate students, Lawrence Kushi, who co-authored two papers with Willett justifying the health benefits of the Mediterranean diet, confided to me that Nestle was "correct in that the evidence [in those papers] is a little impressionistic."

The journal articles that Willett's team wrote to establish the pyramid were not subject to the peer-review process that scientific papers normally undergo; they had only one reviewer, not the usual two to three. This was because the papers were published, along with the entire 1993 Cambridge conference proceedings, in a special supplement of the *American Journal of Clinical Nutrition* funded by the olive oil industry. These kinds of journal supplements sponsored by industry are standard in the field of diet and disease research, although a lay reader is unlikely to be aware of this financial backing, because sponsorship is not noted in the articles themselves.*

Yet as the Mediterranean diet took hold among the public and academic researchers alike, it was hard to resist Willett and his distinguished

*A supplement is recognizable to the discerning reader by the "S" after the page numbers (page "12S," for instance).



colleagues as they coalesced around an exciting and alluring idea.* A new roster of scientific conferences on the Mediterranean Diet beckoned. Even Ferro-Luzzi, who had previously written sternly of her skepticism about the diet's basic definitional problems, was now serving on a clutch of international boards alongside top experts from around the world. The time for scientific questioning seemed to have passed. "The change came when we moved on from science to policy," Ferro-Luzzi explained to me, describing the shift after the 1993 Cambridge conference. "We put out the Mediterranean Diet pyramid, which was rough, imprecise, but gave some connotation of what was compatible with good health. When you get into policy, you forget the minutia. You forget that the ground is not quite solid, a little shaky." Indeed, any uncertainties were soon forgotten. Most people assumed that, after Willett presented the pyramid in Cambridge, all the nitpicky details of the science had already been rigorously worked out, and that the diet was now ready for the wide-angled lens.

## The Mediterranean Diet Conference Craze

The Mediterranean Diet ascended rapidly to the apex of the nutrition world, and a legitimate question to ask is: How did that happen? What made it so much more of an enduring success than the other diets that were popular at the time, including the Zone, Ornish, Atkins, and South Beach, which also laid claim to promises of good health? One obvious reason is that only the Mediterranean Diet was backed by Harvard professors along with a stack of scientific papers that appeared to offer proof of the diet's disease-fighting properties. But the following step was equally if not more important in the Mediterranean Diet's promotion. Trichopoulou's original allies, Willett and Drescher, continued their efforts on behalf of the Mediterranean Diet, and they developed a whole new strategy that had a tremendous influence on nutrition experts, the media, and, ultimately, the public.

*Later Willett trademarked the Mediterranean Diet pyramid as the Harvard Medical School Food Pyramid and used it as the basis for his best-selling book, *Eat, Drink, and Be Healthy: The Harvard Medical School Guide to Healthy Eating* (New York: Simon & Schuster, 2001).

**Walter Willett and Ancel Keys, Cambridge, Massachusetts, 1993**

Ancel Keys, who created the Mediterranean Diet concept, with Walter C. Willett, the Harvard professor who made it famous.

The method involved inviting academic researchers, food writers, and health authorities into a slice of paradise: travel, free of charge, to some sun-kissed country around the gorgeous Mediterranean Sea, for the purpose of a scientific conference. In Italy, Greece, and even Tunisia, scientists rubbed elbows with cookbook authors, chefs, journalists, and public officials. Harvard provided the scientific prestige, while Oldways organized the financing. During the 1990s, there was a steady rollout of these conferences, and they effectively served as a nonstop promotion vehicle for the Mediterranean diet.

Oldways calls itself a "food issues think tank," and when it was founded in 1990, there is no doubt that the leadership was motivated by lofty goals. Drescher and his colleagues wanted Americans to understand food in the context of culture and above all wanted to shift the American conversation away from nutrients and the cold, alienating language of public health toward the language of *food*. After all, no one has ever requested "30 percent fat and 25 percent protein, please" for dinner. The average person just asks for a meal, like spaghetti and meatballs. The movement toward whole foods is familiar to us now, through the work of the author



Michael Pollan, among others, but the original idea was pioneered by Oldways via the Mediterranean diet. The notion was that food, wrapped in the rich complexity of an ancient cuisine, could at once be meaningful and delicious—*and* good for health.

In working to convene people around this profound idea, Oldways organized fifty conferences from 1993 to 2004. And these getaways were an easy sell. The enormous appeal of the Mediterranean had of course been a factor in influencing Keys and his colleagues from the start, and their rapture for the region came even to suffuse their scholarly work. Henry Blackburn, for instance, who worked closely with Keys, wrote a description of the Cretan male who was "free of coronary risk" for the *American Journal of Cardiology* in 1986, using language that is unusually florid for a scientific journal:

> He walks to work daily and labors in the soft light of his Greek Isle, midst the droning of crickets and the bray of distant donkeys, in the peace of his land. . . . In his elder years, he sits in the slanting bronze light of the Greek sun, enveloped in a rich lavender aura from the Aegean sea and sky. He is handsome, rugged, kindly and virile.

The beauty of the landscape and lifestyle, its people, and its diet became united in one, overwhelming swoon. Blackburn admits that he is now embarrassed by this essay. But he says that at the time, "I was feeling very romantic about Crete. I fell in love with it."* Keys himself retired to his villa south of Naples, where he cultivated fruit trees.

Of course, it seems obvious in retrospect that a sustained love affair with the Mediterranean among the twentieth century's most influential nutrition experts helped steered the course of the field. (One has to wonder whether we would know more about the diets of other long-lived peoples,

*Keys's neighbors included his colleagues, who also built villas. Together with Seven Countries study directors Flaminio Fidanza and Martii Karvonen, as well as Jeremiah Stamler, the group formed a cooperative of sorts in the early 1960s and lived part of the year there, becoming a center for scientific meetings and parties (Keys, 1983, 23–24).

such as the Mongolians or Siberians, if researchers were equally drawn to landlocked countries with desert steppes and long, freezing winters. What if they had gone to, say, Germany, which also had low postwar rates of heart disease but possesses fewer sun-drenched conference spots and a likely luncheon menu of *Sauerbraten* and *Blechkuchen*? We shall never know.) The Mediterranean, as a destination, won hands down. And just as Keys and his original group of researchers had been influenced by a love of all things Mediterranean, so, too, was the current crop of experts.

In April 1997, when the island of Crete was flaming with wild lavender irises and electric-purple rockroses, some of the biggest names in food and nutrition were among the 115 people gathered at the Apollonia Beach Hotel in the port town of Heraklion. Walter Willett, Marion Nestle, Serge Renaud (father of the "French paradox"), and Christos Aravanis and Anastasios Dontas, the two original researchers who carried out the Greek portion of the Seven Countries study, all attended, as did National Cancer Institute director Peter Greenwald, famous cooks, and well-known food writers such as Corby Kummer and Mimi Sheraton.

That week, the group led a delectable existence. Serious lectures and discussions on scientific topics such as "50 years of Mediterranean Diet Studies" and "Total Dietary Fat—What Are the Newest Study and Survey Results?" were interspersed with more cultural fare, such as the presentation "At Home with Persephone and Her Mother, Demeter, the Goddess of Grain." There were the trips to museums and ancient palaces as well as a wine tasting and several cooking workshops. One afternoon, women from the nearby prefecture demonstrated how to cook with the traditional ingredients and techniques of Crete. Renaud gave a demonstration on how to prepare snails. Another evening, the group was bused to the top of Mt. Ida, the highest mountain on the island, and ate dinner while the Hale-Bopp comet streaked spectacularly across the night sky.

"It was fabulous. I felt as if I'd died and gone to heaven," says Nestle. "For five years I got invited to absolutely everything they did. . . . We had meetings in the most fabulous places where I never would have been able to go otherwise and under the most lavish circumstances. It was absolutely amazing."



"Every time you sat down there would be eight wine glasses at your setting," remembers Laura Shapiro, then a writer for *Newsweek*, who went on several of the Oldways trips. "It was a level of caretaking and pampering that I had never experienced. Orchids on the pillow, soft air floating in from the balcony, and all that."

Oldways' Drescher was the creative genius behind merging the love of food with nutritional science. "I'm a great believer in trying to create programs that are in some way transformative for people, and not just a bunch of slides and presentations in a lecture hall and having bad food," he said. The educational getaways he organized are widely considered by the scientists, food writers, chefs, and other experts who attended to be some of the greatest food conferences ever. "These kinds of people had never been together at a single conference before. That was, in fact, more dazzling than the hotels," says Shapiro. "To have all those intellectual forces in one room together was just great!" The conferences were a ravishment of wine, scenery, and collegial conversation, and it's easy to see why researchers and food writers made a habit of hopping from one event to the next, all the while passing along glowing reviews about the virtues of the Mediterranean diet to their respective audiences back home.

## "Olive Oil Ambassadors"

These endeavors were obviously expensive, however, and required corporate sponsors, which is why, from the start, Oldways had forged a close relationship with the International Olive Oil Council (IOOC). This agency, headquartered in Madrid, was founded by the United Nations to control olive oil quality and to develop the "world olive and olive-oil economy," in countries nearly all of which border the Mediterranean Sea.*

Before becoming involved with Oldways, the IOOC had tried to

*In Greece, fully 60 percent of the arable land is devoted to growing olives. Olive oil is the number one agricultural export from Spain and the second, after wine, from Italy.

United States as effectively as the Oldways conferences, however. These heady and luxurious experiences, part science seminar, part foodfest, and part cultural celebration, were a stroke of genius in targeting the nutrition world's most influential people.

Nestle spelled out to me the obvious though unspoken quid pro quo of these sorts of conferences: "Every single journalist who went on one of those trips was expected to write about it, and if they didn't, they weren't invited back. . . . Everyone knew what they were supposed to do. And they were happy to do it! If you're in Morocco and being served a dinner where people come in with flaming platters of whatever, you're going to write about it. There's plenty to write about!"

Looking back, however, Nestle, who wrote *Food Politics*, the seminal work on how the food industry influences nutrition policy, recognizes that the conferences were more of a racket than most participants realized. "At the time it seemed totally benign. But it was so seductive. Oldways was basically a for-hire public relations company. . . . And the purpose was to promote the Mediterranean diet for academics like me who got sucked into that," she told me.

Kushi, the former Willett student who now directs scientific policy for Kaiser Permanente, said he and his colleagues all knew that olive oil money was flowing behind these gatherings, but "the fact that it was laundered through Oldways made it a bit more palatable." The experts invited by Oldways were simply too transported by the whole experience, it seems, to be much concerned about a possible industrial agenda underneath.

Eventually, says *Newsweek*'s Laura Shapiro, she was no longer invited to the Oldways conferences because "I couldn't get with the program." She was going on the free trips without writing stories about them explicitly, and at some point, she says, "Oldways told me they couldn't justify my presence to their sponsors."

But in the meantime, Shapiro says she had written about the health benefits of olive oil and had served the Mediterranean diet agenda quite well. "We, the press, were little olive oil ambassadors, everywhere. That's what Oldways created!"

And although some of these "ambassadors," like Shapiro, fell out of favor with Oldways,* inevitably there were others to replace them. Ten years of conferences organized by Oldways elevated the diet into a stratosphere of success, where it has remained, with continuing attention from the media and academic researchers, for decades. The *New York Times* alone has published more than 650 articles with "Mediterranean diet" in the title since Willett's pyramid came out. And nutrition researchers have given it serious, sustained attention, writing more than a thousand scientific papers on the Mediterranean diet since the early 1990s. Epidemiologists in Willett's department at the Harvard School of Public Health, at least one of whom attended every Oldways' conferences throughout the 1990s, have between them published nearly fifty papers on the Mediterranean diet. By comparison, diets such as South Beach and the Zone, which were not introduced by elite university scientists nor promoted by conferences abroad, have been the subject of only a handful of scientific papers. The Atkins and Ornish diets have received slightly more expert attention than these other popular diets, as we'll see in Chapter 10.

Nancy Harmon Jenkins, one of the founders of Oldways and author of *The Mediterranean Diet Cookbook,* acknowledged to me, "The food world is particularly prey to corruption, because so much money is made on food and so much depends on talk and especially the opinions of experts."†

*Ferro-Luzzi believes she was dropped by Oldways because she took an overly critical approach to the science. And Marion Nestle also fell out of favor with Oldways over a dispute involving the financing of the 1993 supplement to the *American Journal of Clinical Nutrition* that the IOOC had funded. Nestle had negotiated the IOOC deal at a luxury hotel in Hawaii, an episode that she writes about in her book *Food Politics*, and which she says she regrets (Ferro-Luzzi, email to author, December 27, 2013; Nestle, interview; Nestle 2002, 114–115).

†For its part, Oldways lost IOOC funding in 2003 and has since put on fewer events. In 2004, in a possibly desperate move, the group picked up the Coca-Cola Company as a major new client and for four years organized conferences called "Managing Sweetness" or "Understanding Sweetness." In the wake of that unfortunate choice, the group unsurprisingly lost some of its stature among nutrition researchers, and its conferences in recent years have been largely devoid of science.

of indexes assume, without any scientific basis, that each component contributes equally to heart disease. Yet can we say that someone who eats no vegetables (minus 1 point) and another person who eats no nuts (also minus 1 point) have increased their risk by exactly the same amount? No evidence exists to answer this kind of question.

A more pointed critical voice has been that of Andy R. Ness, chair of the epidemiology department at the University of Bristol, who told me that the indexes, in addition to their other problems, "don't consider total energy intake [calories], whereas with all the other stuff we do in this field, we adjust for the amount of food people eat." Altogether, he said, the critical thinking that has gone into these indexes has been "pretty dire."

In her defense, Trichopoulou replies that her efforts have at least moved the field forward, and that's true. What seems just inevitable is that the diet's persistence in eluding a clear definition has all but necessitated this kind of soft science—and opened the door for passion and bias to enter in.

"We, as a team at Athens Medical School, we want to keep what for generations we have developed. This is our cry!" Trichopoulou once told me, and this statement seems to confirm the opinion of her colleagues that she is motivated as much by "Mother Greece" as by the science. "Antonia is perhaps guilty, as we all were, of thinking with her heart," says her former colleague Elisabet Helsing, who, as the Advisor on Nutrition for WHO-Europe, was involved in all the early work on the Mediterranean diet. "Many of us in this field, we were led not by the head but by our hearts. The evidence was never so good." Or, as Harvard epidemiologist Frank B. Hu wrote in 2003, in a break with his colleagues, the Mediterranean diet "has been surrounded by as much myth as scientific evidence."

## India's Mediterranean Coast: Problems with the Clinical Trials

It was still possible that well-conducted clinical trials, which are able to demonstrate causation, might finally show the Mediterranean diet to be superior. Where were those trials? Well, there were a few, but the problem was that they were only Mediterranean-*like*, and yet even so, they would serve as the warhorses of evidence for the diet, repeatedly and widely cited. They are therefore worth looking at briefly, if only to show how far nutrition experts will stretch the evidence to bolster support for a favored hypothesis.

The first, with results in 1994, was the Lyon Diet Heart Study. Researchers at a cardiovascular hospital in Lyon, France, took a group of six hundred middle-aged people (almost all men) who had suffered a heart attack in the previous six months and divided them into two equal groups. People in the control group were left to follow their regular doctors' advice and the others were assigned to follow a Mediterranean-style regime. Researchers had wanted to imitate the 1960s Cretan diet but couldn't see how they could persuade French people, unfamiliar with the taste, to adopt olive oil. So instead, they formulated a special margarine made from canola oil and handed it out to subjects in tubs free of charge every two months. Subjects were also counseled to eat a "Mediterranean-type" diet with more fish, white meat rather than red (and less meat overall), and more fruits and vegetables.

After about two years, the special margarine-eating group had suffered three fatal heart attacks and five nonfatal ones, compared to sixteen fatal and seventeen nonfatal ones in the control group. Deaths from other causes were also lower in the group eating the special margarine (eight compared to twenty among the controls). Survival differences between the two groups were so stark that researchers stopped the experiment prematurely to start prescribing the Mediterranean Diet for everyone. And for nearly two decades, the Lyon study was the star study, cited everywhere as key support for the effectiveness of the diet.

Yet the study had enough methodological problems to give any reasonable person pause: It was small ("hopelessly underpowered," meaning not enough subjects, as one researcher commented). Moreover, aside from the margarine, study participants changed their diet from what they usually ate by only a tiny amount, eating very slightly more fish—about an anchovy-strip's worth a day—as well as a small carrot and half a small apple's worth of additional fruit and vegetables a day, compared to the control group. And these differences might have been nonexistent, given that only a hand-

ful of the controls had their diets assessed, which was a huge flaw, given that diet was the variable being studied.*

The big difference between the two groups was the special margarine. What did the margarine contain? Fatally, for the study of the Mediterranean diet, the margarine's fat profile was nothing like olive oil. The margarine was high in alpha-linolenic fatty acid, an omega-3 polyunsaturated fat found in nuts, seeds, and vegetable oils, whereas olive oil contains a monounsaturated fat called oleic. These fats are entirely different in their chemical structures and also their biological effects on humans. So whatever the lessons of the Lyon Diet Heart Study, they are therefore clearly not about the Mediterranean Diet.

In addition to the Lyon study, there was one other clinical trial that was promoted widely for many years by experts as vital evidence for the Mediterranean Diet, since it appeared to show the benefits of a diet high in plant foods and low in saturated fats. As in Lyon, researchers intervened in the diets of middle-aged people who had recently suffered a heart attack. One group was put on a diet "containing star gooseberries, grapes, apples,

*These problems are described in a paper for the American Heart Association, which found itself in the awkward position of trying to reconcile its own recommended low-fat diet with the success of the relatively high-fat diet used in the Lyon study. The authors concluded that the diet had been so minimally assessed in both groups that it "raises questions about the role of diet" in accounting for the "results reported." It's quite possible that the better health outcomes seen in the experimental group were due entirely to what is called the "intervention effect," as the Lyons study directors themselves acknowledged. This refers to the positive way that a study subject responds to an intervention, such as a diet counseling class or even just a little added attention from study administrators, which invariably results in better outcomes for these subjects, compared to those who don't. Trials are therefore usually designed to try to provide equal experiences to both the experimental and control groups to avoid this effect. In the case of the Lyon study, however, members of the experimental group initially received personalized, detailed dietary instructions and were then reminded weekly of their participation in the study due to the margarine deliveries, whereas the control group received no parallel interventions. In an early paper on the study, not cited in the final results, investigators acknowledged these significant differences in the experiences of their two study groups (Kris-Etherton et al. 2001, "a paper by the American Heart Association"; de Logeril et al. 1994; de Logeril et al. 1997).



sweet limes, bananas, lemons, raisins, bail, musk melons, onions, garlic, trichosanthes, fenugreek seeds and leaves, mushrooms, bitter and bottle gourds, lotus roots, Bengal and black grams . . . and oils of soya bean and sun flower."

Sound like the Cretan diet of 1960? Not exactly. Ram B. Singh, a private practitioner, apparently performed this experiment in a facility adjacent to his house in Moradabad, India, in the late 1980s. The diet's limits on meat and eggs and abundance of fruits and vegetables somehow justified its characterization as a "Mediterranean type" of diet, which is how scientists have tended to describe it in the literature. The vegetable oils used barely resembled olive oil, and the foods were very different, but these issues were generally overlooked, and the Indo-Mediterranean Heart Study, as the study was suggestively called for many years, has been widely cited as support for the Mediterranean regime.

Eventually, though, it was discovered that Singh's work was so riddled with problems—the daily food diaries by participants appeared to have been fabricated and the serum cholesterol values were calculated using long outdated methods, among many other things—that the prestigious *British Medical Journal* (BMJ), which had published one of his studies in the first place, conducted a lengthy investigation. Ultimately, this was published under the headline "Suspected Research Fraud" along with a statistical investigation which concluded that Singh's data were "either fabricated or falsified." The BMJ editors expressed their serious reservations about the study and stopped just short of retracting it.*

Years later, however, the Singh study was still being included in scientific literature reviews of the Mediterranean Diet, including an influential one by Lluís Serra-Majem in 2006. As the director of the Madrid-based Mediterranean Diet Foundation, the most important international group

*It appears that Singh passed off the same data as if coming from different clinical trials and managed to get them published in a number of prestigious journals, including the *Lancet*, *American Journal of Clinical Nutrition*, and the *American Journal of Cardiology*. Altogether, he was the first author on papers that claimed to be reporting on twenty-five clinical trials between 1990 and 1994, an impossibly high number, and one of the reasons that his work triggered suspicion (White 2005, 281).

promoting the diet today,* Serra-Majem had every reason to emphasize the positive evidence, yet he stressed to me, "We have to take care with what we do, because otherwise we will have no credibility." Indeed, in his literature review he dismissed many studies for being too small or methodologically weak. For instance, some researchers called a diet "Mediterranean" simply if it contained olive oil, a few extra ounces of walnuts, or a couple of glasses of wine. However, when I asked him about his inclusion of the Singh trial, he confided, "I wanted to leave the door open for that study . . . but I did feel a little bad, like when you're in a court, and you realize that one of your witnesses is not so good."

Like many reviewers before him, Serra-Majem also included the GISSI-Prevenzione trial from Italy, which, despite being widely cited in support of the Mediterranean Diet, was really a trial to test the effectiveness of fish oils and vitamin E supplements in which participants happened to eat something *like* a Mediterranean Diet. This was not the intended intervention of the study, however, so researchers had to change the study hypothesis retroactively in order to include conclusions about diet. Yet altering a hypothesis after the fact is not really considered acceptable science, since it introduces the possibility of bias by the investigators, and any resulting conclusions are thus considered to be weak at best.

Serra-Majem is obviously invested in finding support for the Mediterranean diet; he's the one who submitted the application to UNESCO for the diet on behalf of Spain, Greece, Morocco, and Italy. But it wouldn't be fair to single out any one person for overinterpreting the evidence; the dubious citation of these clinical trials simply grew to be the norm among researchers in the field. Collectively, over time, flaws receded from sight and best results came to be emphasized, until a body of evidence that seemed to justify dietary recommendations became etched into the historical record. The same groupthink happened when the vast majority of researchers came

*His foundation is funded by the Spanish Institute of Agriculture and interested industries, including Dannon and Kellogg's. Serra-Majem is frank about the motivations: "Their interest is in promoting Mediterranean products," but adds that because government funds are lacking, without industry funding, he would be unable to do research (Serra-Majem, interview with author, August 2, 2008; http://dietamediterranea.com/directorio-mediterraneo/enlaces-mediterraneos/).



to overinterpret the studies on the diet-heart hypothesis in order to endorse the low-fat diet. A tacit agreement to turn a blind eye to the shortcomings of the evidence has been a necessary strategy for the survival of both of these official diets.

## A Test of the Real Mediterranean Diet

Nutrition experts were justifiably elated when trial results came out for the *real* diet—not one with specialized margarine, nor with Indian food, but something close to the actual Mediterranean diet itself.

The first major trial, in 2008, was conducted in Israel.* It was well designed and rigorous, with an international group of professors on board, including the epidemiologist Meir Stampfer of the Harvard School of Public Health. These researchers selected 322 moderately obese middle-aged people, mostly men, and fed them one of three diets: one low in carbohydrates, one low in fat, and the third, Mediterranean.† Specially prepared meals were served at a workplace cafeteria, allowing for a high degree of control over what and how much foods were eaten. And the experiment lasted two years, a long time for a trial that involves overseeing the preparation and service of food.

During the entire study, those on the Mediterranean diet were found to have a lower risk for heart disease than those on the low-fat diet. Compared to the low-fat group, the Mediterranean dieters maintained lower triglycerides, higher "good" HDL-cholesterol, lower "bad" LDL-cholesterol, lower C-reactive protein (an indicator of chronic inflammation), and lower insulin (a marker for diabetes); they also lost more weight, averaging about

*There was one other long-term (two-year) trial on a Mediterranean diet, with results in 2004, but it was small and confined to men and women with metabolic syndrome, so nutrition experts did not pay it as much attention (Esposito et al. 2004).

†The "Mediterranean" diet that the researchers used was based on Walter Willett's pyramid; it was "rich in vegetables and low in red meat, with poultry and fish replacing beef and lamb." It was low-calorie (1,500 per day for women and 1,800 per day for men), with a goal of no more than 35 percent of calories from fat; the main sources of added fat were 30 to 45 grams of olive oil and a handful of nuts (five to seven nuts, or less than 20 grams) per day.

10 pounds over two years, compared to 7 pounds for the low-fat group. The Mediterranean diet therefore looked better than the low-fat diet in every possible way. "So my conservative conclusion is, don't start with a low-fat diet," said Stampfer, a pronouncement that would have been unthinkable a decade earlier, in the early 2000s, when the study was conceived.

These are certainly positive results for the much-beloved Mediterranean diet. But do they suggest that the diet is best? Stampfer stresses the point that the people on this diet had the easiest time adhering to it, which is important. But that might be due to the fact that since they were Israeli, it was their local cuisine. Indeed, what Stampfer doesn't like to advertise, and what the study report itself doesn't emphasize, was the notable success of the *third* arm of the study. This was the group eating a low-carbohydrate diet, relatively high in fat. The participants on this diet, it turned out, looked the healthiest of all. They lost even more weight (12 pounds), and their heart disease biomarkers looked even better: their triglycerides were lower and their HDL-cholesterol much higher than the other two groups. Only LDL-cholesterol looked better for Mediterranean dieters, yet this biomarker has proven to be less reliable than previously thought. Therefore, although the finding has received no attention, there's really no doubt that the low-carb diet performed better than both the low-fat and the Mediterranean diets.

Then, in 2013, a large Spanish study came out that grabbed headlines worldwide and seemed to establish the Mediterranean diet's healthfulness once and for all. That study, called Prevención con Dieta Mediterránea, or PREDIMED, was led by a team that included Serra-Majem. The study was a tremendous undertaking, with 7,447 men and women aged fifty-five to eighty, assigned to one of three groups. Two groups were told to eat a Mediterranean diet, for which they were responsible for cooking and preparing meals. In addition, one of the Mediterranean groups received extra allotments of extra-virgin olive oil while the other got extra nuts, provided free to participants. A third group received no free food and served as a control.*

*This study used a "Mediterranean diet score," of the kind that Trichopoulou had invented (see page 207), to evaluate compliance with the diet. The score was comprised of fourteen items for the Mediterranean dieters and nine items for the controls. The consumption of certain items such as eggs had to be overlooked, because only a limited number of items could be scored (Estruch et al. 2013, 24 and 26).



After a median study period of five years, 109 people in the control group had suffered a "cardiovascular event" (a stroke, heart attack, or death related to heart disease), compared to 96 among the extra-virgin olive oil Mediterranean dieters and only 83 in the extra-nuts Mediterranean group. "Mediterranean Diet Shown to Ward Off Heart Attack and Stroke" announced the *New York Times* on the front page of the paper.

However, if you look at PREDIMED's control group, those subjects weren't eating a regular Spanish diet. They were instead on a low-fat diet, because that diet has been the international standard for so many decades. This low-fat group was advised to avoid eggs, nuts, fatty fish, oils, and high-fat foods of all kinds. But that diet, as we know, has now been studied extensively, including in the Women's Health Initiative, the largest dietary trial ever undertaken. And that diet has convincingly been shown to lack any ability to fight heart disease, cancer, or obesity. Therefore PREDIMED, like the Israeli trial, simply demonstrated that the Mediterranean diet was better than the *low-fat diet*.*

If the Israeli trial had never existed, everyone could have assumed that the Mediterranean option in PREDIMED was the best possible regime for health. But that third, low-carb arm in Israel had revealed that an even better option was possible. (Previous shorter trials had found the same thing, as we will see in Chapter 10.) The Mediterranean diet may very well have outperformed the low-fat diet simply *because* it delivered more dietary fat, since the largest difference between the low-fat and Mediterranean groups was the amount of nuts and olive oil they ate. Was it really much of an accomplishment to be better than that failed AHA-USDA low-fat regime?

It's perfectly possible that any national diet would look better when compared to the low-fat diet. Perhaps the traditional Chilean or Dutch

*A few critics noted this point and also observed that the grouping together of various conditions in the "cardiovascular health" end point obscured the fact that there had been no fewer heart attacks among the Mediterranean dieters, compared to controls. The only significant finding had been a drop in strokes, and that was a "minor" absolute reduction seen in the first year of the study only (Opie 2013).

diet, for example—or that of any country eating unrefined, traditional foods—would show fewer cardiovascular events in a comparison with a diet low in fat. We don't know, because such experiments have not been done. Only the Mediterranean diet has been studied so thoroughly. It has monopolized the scientific landscape, with its many days in the Mediterranean sun.

## Reconsidering Why the Cretans Were Long-Lived

Although you have to dig into PREDIMED's appendix to find this out, the various arms of the study all ate the same amount of saturated fat. That is, they ate the same amount of fat from meat, eggs, cheese, and the like. "Well, I think saturated fat is not the main problem," Serra-Majem told me, even before the study results came out.

If that's true, then Keys and his team were probably mistaken in concluding that the low disease rates they observed in Greece and Italy were due to the absence of animal fats that they measured. These researchers were predisposed to finding saturated fat to be a problem. Perhaps they overlooked other aspects of the diet that might have better explained the lack of heart disease among these long-lived peoples? It seems worth circling back to the Seven Countries study to take another look.

Aside from the "Lent problem" (see page 40) and the fact that Keys was observing a population during an uncharacteristic period of postwar hardship, his study on Crete had other, equally troubling issues. Notably, its sample size appears to have been a mere handful of people. Keys originally designed his study with two sources of dietary information in mind: written questionnaires from a larger sample of the population—655 men, in the case of the Greeks—and a collection of duplicates of all the actual foods eaten over the course of a week, from a much smaller sample. This collection of foods was intended to check the questionnaire responses. Yet disappointingly, the answers did not line up as expected. The two sources of dietary data gave different results that could not be reconciled. So Keys assumed that the Cretan men must have been giving inaccurate replies to the questionnaires—and he did a rather astonishing thing. Although you have to read carefully between the lines of his papers to figure it out, Keys ended up simply getting rid of the survey data he had collected from the 655 men on Corfu and Crete.* That left only one source of dietary data for his calculations: the food collected from the smaller group of men. These meals were gathered on three separate occasions on Crete and once on Corfu. Keys went to Corfu twice, actually, but had to throw out one set of data because some of the fats had been "destroyed in processing." Other fats were absorbed into the clay containers used to carry the food samples. In the end, it turned out that only thirty to thirty-three men were sampled on Crete and thirty-four on Corfu.

These, then, are the founding men of the Mediterranean Diet, whose meals over the course of a few weeks fifty years ago have influenced the entire course of nutrition history in the Western Hemisphere. Such a small sample size was in no way statistically representative of the 8.375 million Greeks or even the 438,000 Cretans in 1961. According to statistical formulas, Keys would have needed a sample size of 384 people on each island, which he did have, until he discarded the survey data.

Nonetheless, Keys left the overwhelming impression in his early publications that he had based his calculations on dietary data from all the 655 Cretan men he studied, and this erroneous representation has been passed down through the scientific literature.

When I phoned a leading expert on nutritional epidemiology, Sander Greenland at the University of California, Los Angeles, to ask about the sample size of thirty-three men on Crete, I could almost hear his eyebrows

*Keys's disaffection with dietary surveys as a tool for nutrition research shows up in papers toward the end of his career: "When people simply are queried about their diets their answers from time to time necessarily reflect their own ideas of their stereotypes; they tend to repeat the same answers whether or not they truly correspond to reality." Without the survey data, however, Keys had no record of the individual foodstuffs eaten. When his colleagues tried to describe the actual Cretan diet for one of Trichopoulou's first conferences on the Mediterranean diet, they wrote that the surveys had been "lost" and that they therefore had to reconstruct the diet as best they could from the text of Keys's original paper on the Greek diet. Among their difficulties was the fact that Keys had made no mention of the consumption of fruits or vegetables on Crete (Keys, Aravanis, and Sdrin 1966, 585; Kromhout et al. 1989; Kromhout and Bloemberg in Kromhout, Menotti, and Blackburn 2002, 63).

go up. "If the thirty-three lined up perfectly with respect to some predicted hypothesis," he told me, "one of the possibilities might be fraud." Small data sets that "look 'too good' are considered signs of possible fraud," he said. "In other words, those Keys data sound as shaky as Jell-O in a Cretan earthquake."

Long after Keys published the data, in the 1980s, the Seven Countries study leaders acknowledged that even in that tiny sample, there was so much variation from one visit to the next that not much about the diet could be concluded from these data. But that qualifier has been lost to history.

Then, atop that shaky data, Walter Willett built his pyramid. And his team of researchers had an even more precarious connection to the original reality of the Cretan diet of the 1960s. For example, their pyramid contains no fresh milk, but this seemed to be a mistake. I asked members of the Harvard team about this oversight at an Oldways meeting in 2008; they were onstage, and I raised my hand from the audience. Keys had published a paper only a few years before the pyramid came out, stating that the average Cretan consumed 8 ounces (1 cup) of fresh milk every day, mainly from goats but also from cows, which was more than the US cohort was drinking. Why did this information not make it into the pyramid? I asked. Willett even cited this paper by Keys* but then explained that he is nevertheless excluding milk because it is so "high in saturated fatty acids, which are believed to cause CHD." A fear of saturated fat appeared to trump all other considerations, even the actual data on milk consumption itself. And in answering my question, the team onstage in Cambridge remembered only Willett's assertion from fifteen years earlier: milk was "not generally consumed," they replied.

Another historical inaccuracy of the Mediterranean diet pyramid is the near-absence of red meat. This is ironic because the Cretans actually *preferred* red meat. "In Crete the meat is mostly goat, beef, and mutton, with an occasional chicken or rabbit. In Corfu, the meat is mostly beef and veal," Keys wrote. An earlier survey of the Cretan diet also found the same

*Indeed, Keys's paper is the *only* one that Willett's team cites to document milk consumption from that period (their other principal source was a study that lumped together "milk and cheese") (Kushi, Lenart, and Willett 1995, 1410S).



thing. And it's hard to find a cookbook or historical text on Italy, Spain, or Greece that does not make clear how the populations in these countries favored lamb, goat, and oxen over fowl. Nor were the ancient Greeks feasting on chicken. *The Iliad* describes the dinner given by Achilles for Odysseus this way: "Patrokles put a big bench in the firelight and laid on it the backs of a sheep and a fat goat and the chine of a great wild hog rich in lard."

So how is it that the Mediterranean Diet pyramid recommends the reverse: poultry several times per week and red meat only a few times a *month*? After all, the dramatically lower red meat recommendation was, as Willett wrote, a "major hallmark" of his pyramid.

Part of the answer is that Keys simply ground up all the food that the Cretans ate and sent the mixture back to his lab in Minnesota to have it analyzed. The resulting data that scrolled out of his printer were not a list of food items like snails, mutton, liver. Instead it was a list of macronutrients: saturated fat, monounsaturated fat, protein, carbohydrate, and so on. The saturated-fat content turned out to be low, probably because Keys collected a third of his Cretan data during the fasting holiday of Lent, when animal foods are greatly restricted. Yet in their paper on meat, Willett and his colleagues don't cite any of Keys's original reports about the actual foods eaten. Willett told me that he relied on his own epidemiological findings about red meat instead and that to the extent that he consulted Keys's work, he simply looked at the macronutrient profile and selected poultry as the meat that would best fit the low-saturated-fat specification.*

It was quite a leap. Not only did the selection of chicken as the dominant meat source have no basis in the history of the Mediterranean diet, but one could reasonably question whether chicken has the same effect on health as do Cretan goats or kids or lamb. Red meat, for example, has a far

*Willett's team cites only one study to support the chicken recommendation: his own Nurses' Health Study, which showed an association between lower heart disease rates and a higher consumption of a category called "chicken and fish." The observed association could therefore have been due to the fish rather than the chicken. The rest of the evidence that Willett and his team used to support the choice of chicken is not pro-chicken but rather anti–red meat, and almost all the studies employed to support this case were epidemiological.

greater abundance of vitamins B12 and B6, as well as the nutrients selenium, thiamine, riboflavin, and iron, than does chicken.

So it seems that Willett and his team selected chicken because they were already convinced that red meat was unhealthy, and they took for granted that it couldn't be part of an ideal diet. Recommending lamb and beef, much less goat, would have been inconceivable, whereas promoting chicken fell within acceptable norms.

It therefore appears that in following the Mediterranean Diet, we are relying on data collected by Keys in postwar Greece from a mere handful of men, partly during Lent, and then distorted by Willett's team who, like so many experts, were biased against saturated fat. Cretans in the 1960s clearly drank more milk and ate more red meat than we've been led to believe. Even so, it's curious that this diet in its day, on Crete, was not widely beloved.

It turns out that before Keys arrived on Crete he had been preceded by another epidemiologist, named Leland G. Allbaugh, who was employed by the Rockefeller Foundation in New York to improve its understanding of "underdevelopment." Crete was selected for its pre-industrialized economy, which had suffered gravely during the war. Allbaugh, seeking to understand the human toll of these recent hardships, conducted a thorough study of the Cretan diet, and like Keys, found that their fare "consisted chiefly of foods of vegetable origin, with cereals, vegetables, fruits, and olive oil predominating," with only "small amounts" of meat, fish, and eggs. Yet far from adoring this perfect example of the Mediterranean Diet, Allbaugh reveals a startling reality: the Cretans were openly miserable with their daily fare. "We are hungry most of the time," said one. When asked how their diet could be improved, "Meat alone or with cereal was mentioned as a 'favorite food' by 72% of the families questioned." They had evidently eaten more meat before the war and were now suffering without it.

It was the same for peasants in Calabria, in the boot of Italy, whom, Ferro-Luzzi had visited in the 1970s and described as eating nearly an "ideal" Mediterranean diet, ample in greens and olive oil, with very little meat. Yet according to Vito Teti, a local historian who wrote on this period, the Calabrian peasants and farm laborers considered this diet to be the scourge of poverty and expressed relentless scorn for vegetables, which were considered "not very nourishing." It went beyond simple dislike. A diet of mainly plants was considered nonnutritious—unhealthy, even, which was the main reason that Lent was so disfavored. A rigorous review of survey data led Teti to conclude that Calabrians "considered the lack of food . . . almost entirely vegetarian, as the cause . . . of general mortality for cases linked to nutrition, the low stature of individuals, their physical weakness, their low ability to work and psychological debility. Indeed, in the 1960s, 18 percent of men in southern Italy were of "low stature" (under 5 feet 2 inches), compared to only 5 percent in the north, where more animal foods were eaten. Men from Calabria who were measured when they turned up for military service from 1920 to 1960, were the shortest men in the entire country. To improve their lot, the Calabrians, like the Cretans, desired mainly one thing, as Teti described: "Meat is what these peasants craved, above all else. . . . The robust man, tall and 'erotic,' was the man who had eaten meat."

Of course it's possible that these peasants were misguided in craving meat. If they were of short stature, hungry, and ill much of the time, as Teti documents, then who knows if meat was the magic ingredient that could have solved those problems or if better medical care, more hygiene, or some other kind of food might have served them better?*

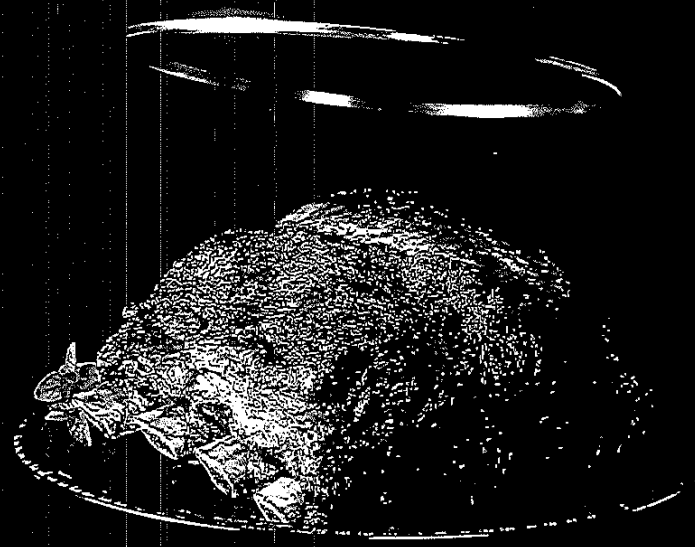
A modern-day nutrition expert would say that these cravings by the poor, if satisfied, would lead to even greater ill-health. Yet historical trends suggest that these peasants were probably right. As Italy and Greece slowly grew more prosperous following the war, they started to leave the near-vegetarian diet behind. From 1960 to 1990, Italian men came to eat ten times more meat on average, which was by far the biggest change in the Italian diet, yet the sizable spike in heart disease rates that might have been expected did not occur; in fact, they declined. And the height of the average Italian male during this time increased by almost three inches.

It was the same in Spain: since 1960, meat and fat consumption have

*One clue from history is that the Mediterranean's meat-loving tradition seems to have quite a pedigree going back to the Romans and Ancient Greeks. Hellenic heroes dined almost exclusively on meat, served with lots of bread and wine, according to scholars who have analyzed the writings of Homer. Only rarely does Homer mention vegetables and fruits, which were "considered beneath the dignity of the gods and heroes" (Yonge 1854, 41).

NEW YORK TIMES BESTSELLER

"A page-turner . . . A gripping read for anyone who has ever tried to eat healthily." —*The Economist*



# THE BIG FAT SURPRISE

## Why Butter, Meat & Cheese Belong in a Healthy Diet

NINA TEICHOLZ

Nina unearths and highlights the incompetence and worse that dominates modern nutrition "science" and dietary advice.
why not BUY THE BOOK!
Regards, Rory