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WHY WE GET FAT

WITH A NEW AFTERWORD: ANSWERS TO FREQUENTLY ASKED QUESTIONS

AND WHAT TO DO ABOUT IT

GARY TAUBES

AUTHOR OF *GOOD CALORIES, BAD CALORIES*

"Taubes stands the received wisdom about diet and exercise on its head."
—*The New York Times*

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WHY WE GET **FAT**

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THIS IS A BORZOI BOOK
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This book is not intended as a substitute for medical advice of physicians. The information given here is designed to help you make informed decisions about your health. However, before starting the dietary recommendations in this book or any other diet regimen, you should consult your physician.

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To N.N.T.

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AUTHOR'S NOTE

This book has been in the works for more than a decade. It began with a series of investigative articles that I wrote for the journal *Science* and then the *New York Times Magazine* on the surprisingly dismal state of nutrition and chronic-disease research. It is an extension and distillation of the five years of further research that became my previous book, *Good Calories, Bad Calories* (2007). Its arguments were honed in lectures at medical schools, universities, and research institutions throughout the United States and Canada.

What I tried to make clear in *Good Calories, Bad Calories* was that nutrition and obesity research lost its way after the Second World War with the evaporation of the European community of scientists and physicians that did the pioneering work in those disciplines. It has since resisted all attempts to correct it. As a result, the individuals involved in this research have not only wasted decades of time, effort, and money but have done incalculable damage along the way. Their beliefs have remained impervious to an ever-growing body of evidence that refutes them while being embraced by public-health authorities and translated into precisely the wrong advice about what to eat and, more important, what not to eat if we want to maintain a healthy weight and live a long and healthy life.

I decided to write *Why We Get Fat* largely because of two common responses that I receive to *Good Calories, Bad Calories*.

The first comes from those researchers who made an effort to understand the arguments in *Good Calories, Bad Calories*, who read the book or listened to one of my lectures or discussed these ideas with me directly. I'm often told by these people that what I'm saying about why we get fat, and about the dietary causes of heart disease, diabetes, and other chronic diseases, makes significant sense. It certainly could be right, they say, with the unspoken implication that what we've been told for the past half-century certainly could be wrong. We all agree that these competing ideas should be tested.

I believe, though, that this is an urgent matter. If so many people are getting fat and diabetic in large part because we've been getting the wrong advice, we

should not be dawdling about determining that with certainty. The disease burdens of obesity and diabetes are already overwhelming not only hundreds of millions of individuals but our health-care systems as well.

Even if these researchers do see the need to address the problem immediately, though, they have obligations and legitimate interests elsewhere, including being funded for other research. With luck, the ideas discussed in *Good Calories, Bad Calories* may be rigorously tested in the next twenty years. If confirmed, it will be another decade or so after that, at least, before our public-health authorities actively change their official explanation for why we get fat, how that leads to illness, and what we have to do to avoid or reverse those fates. As I was told by a professor of nutrition at New York University after one of my lectures, the kind of change I'm advocating could take a lifetime to be accepted.

That is simply too long to wait to get the right answers to these critical questions. So this book was written in part to speed up the process. I offer here the arguments against the conventional wisdom distilled down to their essence. If they certainly could be right, then let's test them, and let's do it sooner rather than later.

The other response I get frequently is from those lay readers, as well as an encouraging number of physicians, nutritionists, researchers, and health administrators, who say that they read *Good Calories, Bad Calories* or listened to my lectures, found the logic and the evidence compelling, and embraced the message implicit in it. They tell me their lives and their health have been transformed in ways they didn't think possible. They have lost weight almost effortlessly and have kept it off. Their risk factors for heart disease have improved dramatically. Some say they no longer need their hypertension and diabetes medications. They feel better and have more energy. Put simply, they feel healthy for the first time in far too long. You can see these kinds of comments on the Amazon web page for *Good Calories, Bad Calories*, where they represent a large proportion of the several hundred personal reviews at the site.

These comments, e-mails, and letters have often come with a request. *Good Calories, Bad Calories* is lengthy (nearly five hundred pages), dense with science and historical context, and densely annotated, all of which I believe was necessary to initiate a meaningful dialogue with the experts and assure that they (or any reader) take nothing I say on trust alone. The book demands that the reader devote considerable time and attention to following the evidence and the arguments. For this reason, many who read it have asked me to write another

book, one that their husbands or wives, their aging parents, or their friends and siblings can read without difficulty. Many physicians have asked me to write a book that they can give to their patients, or even to their fellow physicians, a book that doesn't require such an investment of time and effort.

So this is the other reason I wrote *Why We Get Fat*. I hope by reading it you will understand, perhaps for the first time, why we do get fat and what to do about it.

My one request is that you think critically while you're reading. I want you to keep asking yourself as you read whether what I'm saying really makes sense. To steal a phrase from Michael Pollan, this book is intended to be a thinker's manifesto. Its goal is to refute some of the misconceptions that pass for public-health and medical advice in this country and around the world, and to arm you with the necessary information and logic to take your health and well-being into your own hands.

One word of caution though: If you accept my arguments as valid and change your diet accordingly, you may be going against your doctor's advice, and certainly that of the health organizations and government agencies that dictate the consensus opinion on what constitutes a healthy diet. In that sense, you read this book and act on it at your own risk. That situation can be rectified, though, by giving this book to your physician when you're done reading it, so that he or she, too, can decide who and what to believe. And you might give it to your congressional representatives as well, because the rising tides of obesity and diabetes in the United States and throughout the world are indeed massive public-health problems, not just our own individual burdens to bear. It would help if our elected representatives actually understood how we got into this situation, so they could act finally to resolve it, rather than perpetuate it.

—G.T., September 2010

INTRODUCTION

The Original Sin

In 1934, a young German pediatrician named Hilde Bruch moved to America, settled in New York City, and was "startled," as she later wrote, by the number of fat children she saw—"really fat ones, not only in clinics, but on the streets and subways, and in schools." Indeed, fat children in New York were so conspicuous that other European immigrants would ask Bruch about it, assuming that she would have an answer. What is the matter with American children? they would ask. Why are they so bloated and blown up? Many would say they'd never seen so many children in such a state.

Today we hear such questions all the time, or we ask them ourselves, with the continual reminders that we are in the midst of an epidemic of obesity (as is the entire developed world). Similar questions are asked about fat adults. Why are *they* so bloated and blown up? Or you might ask yourself: Why am I?

But this was New York City in the mid-1930s. This was two decades before the first Kentucky Fried Chicken and McDonald's franchises, when fast food as we know it today was born. This was half a century before supersizing and high-fructose corn syrup. More to the point, 1934 was the depths of the Great Depression, an era of soup kitchens, bread lines, and unprecedented unemployment. One in every four workers in the United States was unemployed. Six out of every ten Americans were living in poverty. In New York City, where Bruch and her fellow immigrants were astonished by the adiposity of the local children, one in four children were said to be malnourished. How could this be?

A year after arriving in New York, Bruch established a clinic at Columbia University's College of Physicians and Surgeons to treat obese children. In 1939, she published the first of a series of reports on her exhaustive studies of the many obese children she had treated, although almost invariably without success. From interviews with her patients and their families, she learned that these obese children did indeed eat excessive amounts of food—no matter how much either they or their parents might initially deny it. Telling them to eat less, though, just didn't work, and no amount of instruction or compassion,

counseling, or exhortations—of either children or parents—seemed to help.

It was hard to avoid, Bruch said, the simple fact that these children had, after all, spent their entire lives trying to eat in moderation and so control their weight, or at least thinking about eating less than they did, and yet they remained obese. Some of these children, Bruch reported, “made strenuous efforts to lose weight, practically giving up on living to achieve it.” But maintaining a lower weight involved “living on a continuous semi-starvation diet,” and they just couldn’t do it, even though obesity made them miserable and social outcasts.

One of Bruch’s patients was a fine-boned girl in her teens, “literally disappearing in mountains of fat.” This young girl had spent her life fighting both her weight and her parents’ attempts to help her slim down. She knew what she had to do, or so she believed, as did her parents—she had to eat less—and the struggle to do this defined her existence. “I always knew that life depended on your figure,” she told Bruch. “I was always unhappy and depressed when gaining [weight]. There was nothing to live for.… I actually hated myself. I just could not stand it. I didn’t want to look at myself. I hated mirrors. They showed how fat I was.… It never made me feel happy to eat and get fat—but I never could see a solution for it and so I kept on getting fatter.”

• • •

Like Bruch’s fine-boned girl, those of us who are overweight or obese will spend much of our lives trying to eat less, or at least eat not too much. Sometimes we succeed, sometimes we fail, but the fight goes on. For some, like Bruch’s patients, the battle begins in childhood. For others, it starts in college with the freshman twenty, that cushion of fat that appears around waist and hips while spending the first year away from home. Still others begin to realize in their thirties or forties that being lean is no longer the effortless achievement it once was.

Should we be fatter than the medical authorities would prefer, and should we visit a doctor for any reason, that doctor is likely to suggest more or less forcefully that we do something about it. Obesity and overweight, so we’ll be told, are associated with an increased risk of virtually every chronic disease that ails us—heart disease, stroke, diabetes, cancer, dementia, asthma. We’ll be instructed to exercise regularly, to diet, to eat less, as though the thought of doing so, the desire to do so, would never otherwise have crossed our minds. “More than in any other illness,” as Bruch said about obesity, “the physician is

called upon only to do a special trick, to make the patient do something—stop eating—after it has already been proved that he cannot do it."

The physicians of Bruch's era weren't thoughtless, and the doctors of today are not, either. They merely have a flawed belief system—a paradigm—that stipulates that the reason we get fat is clear and incontrovertible, as is the cure. We get fat, our physicians tell us, because we eat too much and/or move too little, and so the cure is to do the opposite. If nothing else, we should eat "not too much," as Michael Pollan famously prescribes in his best-selling book *In Defense of Food*, and this will suffice. At least we won't get fatter still. This is what Bruch described in 1957 as the "prevalent American attitude that the problem [of obesity] is simply one of eating more than the body needs," and now it's the prevalent attitude worldwide.

We can call this the "calories-in/calories-out" or the "overeating" paradigm of excess fat—the "energy balance" paradigm, if we want to get technical. "The fundamental cause of obesity and overweight," as the World Health Organization says, "is an energy imbalance between calories consumed on one hand, and calories expended on the other hand."* We get fat when we take in more energy than we expend (a positive energy balance, in the scientific terminology), and we get lean when we expend more than we take in (a negative energy balance). Food is energy, and we measure that energy in the form of calories. So, if we take in more calories than we expend, we get fatter. If we take in fewer calories, we get leaner.

This way of thinking about our weight is so compelling and so pervasive that it is virtually impossible nowadays *not* to believe it. Even if we have plenty of evidence to the contrary—no matter how much of our lives we've spent consciously trying to eat less and exercise more without success—it's more likely that we'll question our own judgment and our own willpower than we will this notion that our adiposity is determined by how many calories we consume and expend.

My favorite example of this thinking came from a well-respected exercise physiologist, a co-author of a set of physical-activity and health guidelines that were published in August 2007 by the American Heart Association and the American College of Sports Medicine. This fellow told me that he personally had been "short, fat, and bald" when he first took up distance running in the 1970s, and now he was in his late sixties and was "short, *fatter*, and bald." In the

intervening years, he said, he had gained thirty-odd pounds and run maybe eighty thousand miles—the equivalent, more or less, of running three times around the Earth (at the equator). He believed that there was a limit to how much exercise could help him maintain his weight, but he also believed he would be fatter still if he hadn't been running.

When I asked him whether he really thought he might be leaner had he run even more, maybe run four times around the planet instead of three, he said, "I don't see how I could have been more active. I had no time to do more. But if I could have gone out over the last couple of decades for two to three hours a day, maybe I would not have gained this weight." And the point is that maybe he would have anyway, but he just couldn't wrap his head around that possibility. As sociologists of science would say, he was trapped in a paradigm.

Over the years, this calories-in/calories-out paradigm of excess fat has proved to be remarkably resistant to any evidence to the contrary. Imagine a murder trial in which one credible witness after another takes the stand and testifies that the suspect was elsewhere at the time of the killing and so had an airtight alibi, and yet the jurors keep insisting that the defendant is guilty, because that's what they believed when the trial began.

Consider the obesity epidemic. Here we are as a population getting fatter and fatter. Fifty years ago, one in every eight or nine Americans would have been officially considered obese, and today it's one in every three. Two in three are now considered overweight, which means they're carrying around more weight than the public-health authorities deem to be healthy. Children are fatter, adolescents are fatter, even newborn babies are emerging from the womb fatter. Throughout the decades of this obesity epidemic, the calories-in/calories-out, energy-balance notion has held sway, and so the health officials assume that either we're not paying attention to what they've been telling us—eat less and exercise more—or we just can't help ourselves.

Malcolm Gladwell discussed this paradox in *The New Yorker* in 1998. "We have been told that we must not take in more calories than we burn, that we cannot lose weight if we don't exercise consistently," he wrote. "That few of us are able to actually follow this advice is either our fault or the fault of the advice. Medical orthodoxy, naturally, tends toward the former position. Diet books tend toward the latter. Given how often the medical orthodoxy has been wrong in the past, that position is not, on its face, irrational. It's worth finding out whether it is true."

After interviewing the requisite number of authorities, Gladwell decided that

it was our fault, that we simply “lack the discipline … or the wherewithal” to eat less and move more—although for some of us, he suggested, bad genes extract a greater price in adiposity for our moral failings.

I will argue in this book that the fault lies entirely with the medical orthodoxy—both the belief that excess fat is caused by consuming excess calories, and the advice that stems from it. I’m going to argue that this calories-in/calories-out paradigm of adiposity is nonsensical: that we don’t get fat because we eat too much and move too little, and that we can’t solve the problem or prevent it by consciously doing the opposite. This is the original sin, so to speak, and we’re never going to solve our own weight problems, let alone the societal problems of obesity and diabetes and the diseases that accompany them, until we understand this and correct it.

I don’t mean to imply, though, that there is a magic recipe to losing weight, or at least not one that doesn’t include sacrifice. The question is, what has to be sacrificed?

The first part of this book will present the evidence against the calories-in/calories-out hypothesis. It will discuss many of the observations, the facts of life, that this concept fails to explain, why we came to believe it anyway, and what mistakes were made as a result.

The second part of this book will present the way of thinking about obesity and excess fat that European medical researchers came to accept just prior to the Second World War. They argued, as I will, that it is absurd to think about obesity as *caused* by overeating, because anything that makes people grow—whether in height or in weight, in muscle or in fat—will make them overeat. Children, for example, don’t grow taller because they eat voraciously and consume more calories than they expend. They eat so much—overeat—because they’re growing. They *need* to take in more calories than they expend. The reason children grow is that they’re secreting hormones that make them do so—in this case, growth hormone. And there is every reason to believe that the growth of our fat tissue leading to overweight and obesity is also driven and controlled by hormones.

So, rather than define obesity as a disorder of energy balance or eating too much, as the experts have for the past half-century, these European medical researchers started from the idea that obesity is fundamentally a disorder of excess fat accumulation. This is what a philosopher would call “first principles.”

It’s so obviously true that it seems almost meaningless to say it. But once we do, then the natural question to ask is, what regulates fat accumulation? Because whatever hormones or enzymes work to increase our fat accumulation naturally—just as growth hormone makes children grow—are going to be the very likely suspects on which to focus to determine why some of us get fat and others don’t.

Regrettably, the European medical-research community barely survived the Second World War, and these physicians and their ideas about obesity weren’t around in the late 1950s and early 1960s, when this question of what regulates fat accumulation was answered. As it turns out, two factors will essentially determine how much fat we accumulate, both having to do with the hormone insulin.

First, when insulin levels are elevated, we accumulate fat in our fat tissue; when these levels fall, we liberate fat from the fat tissue and burn it for fuel. This has been known since the early 1960s and has never been controversial. Second, our insulin levels are effectively determined by the carbohydrates we eat—not entirely, but for all intents and purposes. The more carbohydrates we eat, and the easier they are to digest and the sweeter they are, the more insulin we will ultimately secrete, meaning that the level of it in our bloodstream is greater and so is the fat we retain in our fat cells. “Carbohydrate is driving insulin is driving fat,” is how George Cahill, a former professor of medicine at Harvard Medical School, recently described this to me. Cahill had done some of the early research on the regulation of fat accumulation in the 1950s, and then he coedited an eight-hundred-page American Physiological Society compendium of this research that was published in 1965.

In other words, the science itself makes clear that hormones, enzymes, and growth factors regulate our fat tissue, just as they do everything else in the human body, and that we do not get fat because we overeat; we get fat because the carbohydrates in our diet make us fat. The science tells us that obesity is ultimately the result of a hormonal imbalance, not a caloric one—specifically, the stimulation of insulin secretion caused by eating easily digestible, carbohydrate-rich foods: refined carbohydrates, including flour and cereal grains, starchy vegetables such as potatoes, and sugars, like sucrose (table sugar) and high-fructose corn syrup. These carbohydrates literally make us fat, and by driving us to accumulate fat, they make us hungrier and they make us sedentary.

This is the fundamental reality of why we fatten, and if we’re to get lean and stay lean we’ll have to understand and accept it, and, perhaps more important, our doctors are going to have to understand and acknowledge it, too.

If your goal in reading this book is simply to be told the answer to the question “What do I do to remain lean or lose the excess fat I have?” then this is it: stay away from carbohydrate-rich foods, and the sweeter the food or the easier it is to consume and digest—liquid carbohydrates like beer, fruit juices, and sodas are probably the worst—the more likely it is to make you fat and the more you should avoid it.

This is certainly not a new message. Until the 1960s, as I’ll discuss later, it was the conventional wisdom. Carbohydrate-rich foods—bread, pasta, potatoes, sweets, beer—were seen to be uniquely fattening, and if you wanted to avoid being fat, you didn’t eat them. Since then, it has been the message of an unending string of often best-selling diet books. But this essential fact has been so abused, and the relevant science so distorted or misinterpreted, both by proponents of these “carbohydrate-restricted” diets and by those who insist that they are dangerous fads (the American Heart Association among them) that I want to lay it out once more. If you find the argument sufficiently compelling that you want to change your diet accordingly, then all the better. I will give some advice on how to do so, based on the lessons learned by clinicians who have years of experience using these diets to treat their overweight and often diabetic patients.

In the more than six decades since the end of the Second World War, when this question of what causes us to fatten—calories or carbohydrates—has been argued, it has often seemed like a religious issue rather than a scientific one. So many different belief systems enter into the question of what constitutes a healthy diet that the scientific question—why do we get fat?—has gotten lost along the way. It’s been overshadowed by ethical, moral, and sociological considerations that are valid in themselves and certainly worth discussing but have nothing to do with the *science* itself and arguably no place in a scientific inquiry.

Carbohydrate-restricted diets typically (if not, perhaps, ideally) replace the carbohydrates in the diet with large or at least larger portions of animal products—beginning with eggs for breakfast and moving to meat, fish, or fowl for lunch and dinner. The implications of that are proper to debate. Isn’t our dependence on animal products already bad for the environment, and won’t it just get worse? Isn’t livestock production a major contributor to global warming, water shortages, and pollution? When thinking about a healthy diet, shouldn’t we think

about what’s good for the planet as well as what’s good for us? Do we have a right to kill animals for our food or put them to work for us in producing it? Isn’t the only morally and ethically defensible lifestyle a vegetarian one or even a vegan one?

These are all important questions that need to be addressed, as individuals and as a society. But they have no place in the scientific and medical discussion of why we get fat. And that’s what I am setting out to explore here—just as Hilde Bruch did more than seventy years ago. Why are we fat? Why are our children fat? What can we do about it?

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*Such official pronouncements are effectively universal. Here are a few more: The U.S. Centers for Disease Control: “Weight management is all about balance—balancing the number of calories you consume with the number of calories your body uses or ‘burns off.’ ” The U.K. Medical Research Council: “Although the rise in obesity cannot be attributed to any single factor, it is the simple imbalance between energy in (through the food choices we make) and energy out (mainly through physical activity) which is the cause.” INSERM, the French National Institute of Health and Medical Research: “Excess body weight and obesity always result from an imbalance between energy intake and energy expenditure.” The German Federal Ministry of Health: “Overweight is the result of too much energy consumed compared with the energy expended.”

BOOK I

Biology, Not Physics

1

Why Were They Fat?

Imagine you're serving on a jury. The defendant is accused of some heinous crime. The prosecuting attorney has evidence that he says implicates the defendant beyond reasonable doubt. He says the evidence is as clear as day and that you must vote to convict. This criminal must be put beyond bars, you're told, because he's a threat to society.

The defense attorney is arguing just as vehemently that the evidence is not so clear-cut. The defendant has an alibi, albeit not one that's airtight. There are fingerprints at the crime scene that don't match the defendant's. He suggests the police may have mishandled the forensic evidence (the DNA and hair samples). The defense argues that the case is not nearly as definitive as the prosecutor has led you to believe. If you have reasonable doubt, as you should, you must acquit, he says. If you put an innocent man behind bars, you're told, not only do you do that person an incalculable injustice, but you leave the guilty party free to strike again.

In the jury room, your job is to assess the claims and counterclaims and make a decision based solely on the evidence. It doesn't matter what your inclinations might have been when the trial began. It doesn't matter whether you thought the defendant looked guilty or didn't appear to be the kind of person who could commit such a horrible act. All that matters is the evidence and whether or not it's convincing.

One thing we know about criminal justice is that innocent people are often convicted of crimes they didn't commit, despite a judiciary system that is dedicated to avoiding just that outcome. A common theme in the litany of justice poorly served is that those wrongly convicted are typically the obvious suspects. Their conviction feels right; evidence that might exculpate them is more easily disregarded. Complicated questions are pushed aside, as is evidence that just might free them after their conviction.

It would be nice to think that science and scientists don't make such errors, but they happen all the time. It's human nature. The methods of science are