

The
CHEESE
TRAP

ALSO BY NEAL D. BARNARD, MD, FACC

The Power of Your Plate

A Physician's Slimming Guide

Food for Life

Eat Right, Live Longer

Foods That Fight Pain

Turn Off the Fat Genes

Breaking the Food Seduction

Nutrition Guide for Clinicians

The Cancer Survivor's Guide

Dr. Neal Barnard's Program for Reversing Diabetes

21-Day Weight Loss Kickstart

Power Foods for the Brain

The
CHEESE
TRAP

How Breaking a Surprising Addiction
Will Help You Lose Weight,
Gain Energy, *and* Get Healthy

Neal D. Barnard, MD, FACC

Recipes by Dreena Burton
Foreword by Marilu Henner

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Foreword

I was caught in the Cheese Trap.

For years, I was the girl whose idea of a gourmet meal was a pot of cheese fondue followed by cheesecake. I would think nothing of spending three days chipping away at a pound of Jarlsberg, eating no other food, and proudly calling it my “1,700-Calories-a-Day Diet”! Every two weeks for several months at a time, I would stop at Zabar’s on my way to unemployment to buy what they called “Cheese Ends,” which was nothing more than what was left over after they cut up blocks of cheese. Five different little chunks in every bag, and I’d buy at least five bags with my hard-earned unemployment dollars. I was not only unemployed; I was also fat, constipated, and had pimples. My skin was puffy and toxic looking. I weighed 54 pounds more than I do today. And I was so intestinally clogged that I had to spend time in a clinic because I hadn’t been able to “take out the trash” for seventeen days. Seventeen days of constipation.

All because of cheese.

Not milk. (I never had a full glass.)

Not yogurt. (Not my thing.)

Not cottage cheese. (Yuck.)

It was the cheese. And I craved it every day.

I can honestly say that the single most important step I took in my health journey was giving up dairy products—cheese, in particular. I had been voraciously reading about the effects of different foods on your body because I had lost my parents at an early age and needed a way to make sense of their deaths. I was seventeen when my father died of a heart attack at fifty-two, and I was barely twenty-six when my mother succumbed to the ravages of rheumatoid arthritis. She was fifty-eight. I knew my health needed improving, so I started making changes. But nothing had quite the impact on my health like giving up cheese. In fact, I consider the day I gave up cheese forever—Wednesday, August 15, 1979—my true health birthday. This was the day when everything I had been reading about dairy products came together, and it finally hit me: *The only thing dairy is supposed to do is turn a 50-pound calf into a 300-pound cow in six months. (If those are your aspirations, knock yourself out!) A human being has twenty-seven feet of intestines and one stomach, while a baby calf has nine feet of intestines and four stomachs! Why are we drinking cow's or goat's milk and not orangutan milk—our closest mammal relative? And you would never make cheese from the breast milk of your next-door neighbor, but you are sucking from the udder of a cow you don't even know! And cheese is even worse! More concentrated and full of salt and bacteria. What was I thinking?*

When I gave up dairy, everything about me changed.

My skin cleared, my cheeks de-puffed, my nose narrowed, my eyes brightened, my body streamlined.

Gone was the bloated feeling after eating. And the sore throats and colds I'd gotten four times a year since I was a kid. Mucus was no longer coursing through my body, clogging my sinuses, pores, and digestive tract. The “spare tire” I thought

was going to be there forever disappeared, because I was finally able to take out the trash. Every. Single. Day. (And then some!) I stopped yo-yo dieting because I was no longer taxing my body by ingesting a food it wasn't designed to break down. I dropped the extra weight in a healthy way, and I've kept it off since that fateful day in 1979. Everything else improved, too, including my attitude, sleeping habits, speaking, singing, breathing, and breath. I no longer felt a general malaise. It was as if a fog lifted and I could think more clearly, all because I was no longer held prisoner by my cheese addiction. I was no longer an unsuspecting "mouse" caught in the Cheese Trap!

I've known Dr. Neal Barnard for over fifteen years as the best resource for great cutting-edge health and medical information. There is no one better at taking dry, esoteric scientific data and making it not only understandable, but also entertaining! Time and again I've seen him captivate an audience by walking them through a process from what they think they know about a subject to a greater understanding that stays with them years later. His images and explanations are so simple, yet so profound, you know you will be using them to explain to other people why you might have made a certain health choice.

In this remarkable book, you will learn everything you've ever wanted to know about cheese and why it's got such a stranglehold on most of us. Dr. Barnard has broken down all of the research and food science in such a way that you will never look at another piece of Cheddar, Swiss, or mozzarella in the same way again. All cheeses will be gone for Gouda! (Sorry, I couldn't resist!)

Dr. Barnard not only explains what's in cheese and why it's so addictive; he also walks you through the cheese-making process from the animals' and manufacturers' points of view and how it's become the industry giant it is today. As usual, Dr. Barnard leaves no stone unturned, and the world is a better place for it.

So if you want to be healthier, happier, and look like the animal you were meant to be—because you are no longer ingesting a product from the mother’s milk of an animal you have nothing to do with—then this is the book for you! And if you know someone who snores, gets sore throats and colds, fights their weight, deals with hormonal imbalances, please give them a copy, too!

—Marilu Henner,
actress, *New York Times* bestselling author,
radio host, and health advocate

A Note to the Reader

I hope this book provides you with new insights on food and health and more than a few interesting facts to share. Before we begin, let me mention two important points:

See your health care provider. Health problems can be serious business. If you are making a diet change—and I hope you are—it is a good idea to talk with your doctor along the way. This is not because changing your diet is dangerous. Quite the opposite. It is a really good idea. But people who are taking medications—for diabetes or high blood pressure, for example—very often need to adjust their medications when they improve their diets. Sometimes, they are able to discontinue their drugs altogether. Do not do this on your own. Work with your health care provider to reduce or discontinue your medicines if and when the time is right.

Also, talk with your doctor before you jump into a new exercise routine. If you have been sedentary, have any serious health problems, have a great deal of weight to lose, or are over forty, have your provider check whether you are ready for exercise, and how rapidly to begin.

Get complete nutrition. The way of eating presented in this book is likely to improve your nutrition overall, in addition to the

specific health benefits it may bring. Even so, you will want to ensure that you get complete nutrition. Please read the details in Chapter 9. In particular, be sure to take a daily multiple vitamin or other reliable source of vitamin B₁₂, such as fortified cereals or fortified soy milk. Vitamin B₁₂ is essential for healthy nerves and healthy blood.

INTRODUCTION

Hidden in Plain Sight

Does this sound familiar? You'd like to lose a few pounds, but you're having trouble, and it's hard to figure out why. Your eating habits are really not too bad. Maybe you're not exercising quite as much as you'd like, but you're not entirely sedentary either. And still, it's a challenge to lose weight.

Or maybe you have a health condition that is just not getting better: high cholesterol, high blood pressure, diabetes, sore joints, headaches, or less-than-healthy-looking skin. What could be causing the problem?

The answer could be hiding in plain sight.

Imagine losing weight easily, week by week, month by month, without counting calories—and without adding one minute of exercise. Imagine your friends asking how you succeeded at trimming away all those pounds. Imagine them telling you how great you look. Imagine your cholesterol improving, your blood pressure getting better, and your health rebounding day by day.

If you're looking to revamp your eating habits to lose weight

or improve your health, the place to start is not with sugar, carbs, or processed foods. The place to start is with cheese.

You love cheese. But I'm sorry to tell you, it does not love you back. And the sooner you recognize it, the sooner you'll conquer your weight or health problems.

"No way!" you might be thinking. "That's impossible!"

Think again. Cheese packs a surprising number of calories—more than enough to explain the weight that you have gained over the years. And what cheese makers did not tell you is that cheese harbors mild opiates that might be just strong enough to keep you hooked. That "fattening-addictive" combination is what makes cheese a serious problem for your weight.

And it gets worse. Because cheese comes from a cow—often a *pregnant* cow—you are getting a dose of estrogens—female sex hormones—that you never bargained for. And cheese makers add enough salt to make cheese one of the highest-sodium foods. It is high in saturated fat and cholesterol, too. Loaded with calories, high in sodium, packing more cholesterol than steak, and sprinkled with hormones—if cheese were any worse, it would be Vaseline.

"What!?" you are now asking. "Cheese? There's no way it could be that fattening. And to call it addictive is ridiculous! And besides, I love cheese."

Hold that thought.

First of all, you don't need to give up that taste—you just need healthier ways to get it, and I'll show them to you. But, yes, cheese is more fattening—by far—than bread, potatoes, or even pure sugar. Here's why: Most of the calories—about 70 percent—in typical cheeses come from fat, and every last fat gram packs 9 calories.

Compare that to sugar: It turns out that pure sugar has only

4 calories per gram. And to turn sugar into fat, your body has to completely rearrange the sugar molecules; that process burns off another quarter of its calories, or thereabouts.

That's not to say that sugar is health food. But cheese fat has more than twice the calories found in the most concentrated sugar, and its calories are easily stored on your belly, around your thighs, under your chin, and everywhere else. You can see them and feel them, and they show up on the scale.

And what about that addictive effect? Not only does cheese have the saltiness and mouthfeel that some people crave, but as cheese is digested, it releases special chemicals, called *casomorphins*. In the brain, these chemicals attach to the same opiate receptors that heroin or morphine attach to. Don't get me wrong—casomorphins are nowhere near as mind-numbing as illegal narcotics. But, like heroin and morphine, casomorphins are indeed opiates that affect the brain.

Think of it this way: Coffee contains caffeine, a mild stimulant. While caffeine is not as powerful as, say, amphetamines, it is still strong enough to keep you hooked, as any coffee drinker will tell you. Casomorphins have subtle brain effects, too. And evidence shows that they can keep you hooked, too.

Some foods are fattening. Others are addictive. Cheese is both—fattening *and* addictive. And that's the problem.

Does it matter? It sure does. Look at the numbers: An average American eats more than 33 pounds of cheese every year. Now imagine if just one and a half of those 33 pounds showed up on the scale each year (which, in fact, happens to be the amount of weight the average American gains each year). Over a decade, that adds up to 15 unwanted pounds, and 30 pounds every two decades. Sound familiar? That's more than enough to explain the weight epidemic in the U.S.

All the Taste, None of the Regrets

A surprising number of health problems are linked to cheese and other dairy products. If your cholesterol is high, could it be because cheese is a huge source of cholesterol-boosting saturated fat, as well as cholesterol itself? If your blood pressure is up, could it be because cheese is also loaded with blood pressure-raising sodium, plus enough fat that it makes your heart push harder to pump your blood? If you have diabetes, could it be that the “bad fat”—saturated fat—that predominates in cheese is causing the insulin resistance that is the hallmark of this condition?

If you have rheumatoid arthritis or any other autoimmune condition, could it be that dairy proteins—which are highly concentrated in cheese—are triggering your symptoms? And what about the hormone effects of cheese? In this book, we will cover all of these and much more.

Filled with fat, crammed with cholesterol, and steeped in sodium, cheese is a seriously unhealthy product. Its addictive properties keep you hooked, even while it works its mischief on your waistline and damages your health.

But here’s the good news. I will show you how to slim down and dramatically improve your health by gaining control over this gooey yellow monster. Yes, there are ways to get the taste of cheese, with none of the regrets.

I’ll show you how to make the best lasagna, the most delicious pizza, a perfect sandwich topping, a mac and cheese that will delight any twelve-year-old, and many, many other wonderfully tasty foods. You’ll know exactly which foods to choose when you’re dining out, whether you are at a Michelin-starred restaurant or a fast-food spot. As you savor these delicious foods,

you'll almost feel your waistline trimming, your cholesterol and blood pressure coming down, and your health improving.

Most importantly, you will look at foods very differently. Some give you a health boost, while others get in your way, and now you'll know exactly which are which, and you'll take that power into your day-to-day life.

Real People, Real Results

In this book, you will meet people whose lives have been transformed. Patricia suffered with stubborn weight problems, diabetes, and worsening heart disease until she discovered that a simple diet change could trim away 95 pounds and make her feel great. Marc had a similar experience. His extra weight melted away, as did diabetes, hypertension, cholesterol problems, and erectile dysfunction. He got his life back.

Katherine, an aerospace engineer, was at the point of needing a hysterectomy to treat endometriosis, a hormone-related condition that causes intractable abdominal pain and can threaten fertility. Breaking a love affair with cheese and other unhealthy foods cured her pain, trimmed her waistline, and let her live again.

Lauren, an attorney, suffered with crushing migraines. Once she discovered that her headaches were triggered by dairy proteins, she had more power than a prescription could deliver. Migraines? Gone!

Ann suffered from respiratory problems and a chronically out-of-sorts digestive tract. She was the daughter of a milk processor, so dairy products were the last thing she imagined would have been the cause of her problems. But when a doctor suggested going dairy-free, her problems disappeared.

You will also meet some people in the cheese industry who have devoted countless hours and millions of dollars to keeping you hooked on cheese—people who have signed surprising financial arrangements with restaurant chains to, in so many words, *trigger cheese cravings*. And you will meet innovators, like Michael Schwarz, Miyoko Schinner, and Tal Ronnen, who have devised delightful savory cheeses from healthful, entirely plant-based ingredients, with none of the moo or goo of dairy cheeses. You'll meet restaurateurs like Nanci Alexander, whose gourmet restaurant replaced *all* the cheese with truly exquisite ingredients that keep customers coming back for more. They are revolutionizing the world of food.

Let me also introduce myself. I grew up in Fargo, North Dakota, and went to medical school at the George Washington University in Washington, DC, and am on the faculty there today. In 1985, I founded the Physicians Committee for Responsible Medicine to bring a new emphasis on prevention and nutrition into medical practice and to improve how research is conducted.

Over the years, the Physicians Committee has completed many research studies to elucidate how foods affect body weight, cholesterol, blood pressure, diabetes, and chronic pain. Some of our studies have been very influential. In 2003, the National Institutes of Health funded us to test a new dietary approach to type 2 diabetes that turned out to be the most powerful program of its kind ever developed. Many people are using it to improve their diabetes and sometimes even make it go away.

We worked with GEICO—the insurance company—to see how a nutrition program might work in the workplace, finding that simple diet changes can revolutionize the health of employees. In 2015, the U.S. government cited our research work as strong evidence for recommending plant-based diets in the Dietary Guidelines for Americans.

In the course of our studies, I have noticed an odd phenomenon. A surprising number of people whose health dramatically improved from dietary changes reported that, despite all their health improvements, they still found themselves having a hankering for cheese. Not ice cream, not yogurt, not chocolate milk, but specifically cheese. Even when cheese had been a huge contributor to their health problems, their cravings made it hard to tear themselves away.

After hearing this over and over, I began to study cheese's effects on our health and to investigate why it has such a surprisingly strong attraction. This book shares what I've found. I hope you find it enlightening, fun, encouraging, and powerful. And I hope you will share the power of what you are about to learn with everyone you know. I wish you the very best of health.

CHAPTER 1

The Ultimate Processed Food

Fugu is the world's second-strangest food. Fugu is the Japanese word for the meat of the puffer fish, that small creature who, when threatened, turns himself into a spike-covered balloon. Puffer fish have more than spikes; they also harbor deadly tetrodotoxin. One bite contains enough poison to paralyze your diaphragm and arrest your breathing.

The possibility of death by suffocation has not stopped adventurous diners from wanting to taste it. And Japanese chefs have been willing to dedicate three or more years of their lives to learning the fine art of separating the poisonous and non-poisonous puffer fish parts in order to be legally allowed to serve it.

You really have to wonder, how did this start? What courageous adventurers were willing to experiment, Russian roulette-style, with various puffer fish organs until they got it right?

Well, the puffer fish has nothing on Camembert. Cheese

is easily the world's strangest food, and the most improbable. Mother Nature never imagined anything like this.

First of all, one of our human forebears had to *want* to take milk from another species. It apparently took two and a half million years of human existence before that idea popped into someone's head. Then he or she had to figure out how to make an animal stand still long enough to extract her milk. That, too, was a challenge, when you consider the size of the animals involved and the fact that very few would be lactating at the appropriate time. And since animals produce milk only for a limited period of time after giving birth, our prehistoric food pioneer would have had to sort out how to keep milk flowing.

Then he or she had to mix the milk with bacteria to ferment it, and then combine it with enzymes hidden in the lining of the fourth stomach of a calf.

Finally, people had to *like* the gooey result—which was not a foregone conclusion, given that the smell of cheese is the smell of bacterial decomposition. In fact, the *brevibacteria* used to produce Muenster, Limburger, and several other common cheeses are the very germs responsible for the stench of unwashed human feet.

What are the odds? Makes fugu sound easy.

Indeed, cheese was not exactly an overnight sensation. There was not a single cheese factory in the U.S. until 1851, and it was not until 1935 that the average American ate even 5 pounds of it per year. But eventually it found its way into our hearts.

Into our coronary arteries, to be more precise. And into our thighs and hips, and spilling onto our medical charts. The health problems cheese causes are more subtle and protracted than puffer fish poisoning, but they are extremely common. So much so that most people assume they are just part of life.

In this chapter, we'll take a look at this odd, familiar, smelly, and loved product; how cheese makers turn a pail of milk into a block of cheese; and how a product of bacterial decomposition becomes hard to resist. In later chapters, we will see what happens when you swallow it.

Making Cheese

Cheese making is not without some theoretical advantages. Anyone who drinks milk knows that it does not stay fresh very long; turning it into cheese preserves it. Along the way, cheese concentrates milk's fat, protein, and calories. It also makes it a lot more portable.

Cheese also eliminates lactose, the milk sugar that is indigestible for many people. Nursing babies can digest lactose and use it for energy. But after the age of weaning, the enzymes that digest lactose start to disappear and, without them, milk causes cramps and diarrhea. Although many people—especially whites—carry a genetic mutation that makes those enzymes persist longer, the majority of adults are lactose-intolerant. But when milk is turned into cheese, that indigestible lactose is mostly removed.

To see how cheese is made, let's take a trip to the tiny town of Theresa, Wisconsin, northwest of Milwaukee. A little factory on Henni Street has been cranking out cheese since 1900. In 1905, John Widmer arrived in the U.S. from Switzerland, learned the cheese-making craft, and eventually took over the factory. It has stayed in the Widmer family ever since.

As you arrive in Theresa, you realize that you saw surprisingly few cows along the country roads. Obviously, the number-one cheese-producing state would need lots and lots of cows, but

the fields were empty, for the most part. Where they are is something we'll touch on in Chapter 7.

Nonetheless, a huge milk shipment arrives at the Widmer's Cheese Cellars factory early each morning and is poured into two large vats, each about twenty feet long and three feet deep. It takes more than a gallon of milk to make a pound of Cheddar.

Because milk comes from a living, breathing animal, its chemical makeup varies from batch to batch, and that affects the taste or texture of the cheese. So cheese producers can head off problems by *standardizing* the milk—adding cream, skim milk, or skim milk powder, as the case may be, to keep the fat and protein content uniform from batch to batch.

They can also adjust the color. Cheese's orange color comes, in part, from traces of beta-carotene in milk—the same beta-carotene that gives an orange color to carrots and sweet potatoes. It is too dilute to be seen in milk, but it becomes visible as milk fat is concentrated in the cheese-making process. Widmer's and other cheese makers can legally intensify the color with *annatto*, a tree extract from Latin America and the Caribbean.

Goats, sheep, and water buffalos do not secrete beta-carotene into their milk as cows do, so their cheese is white. To make cow's milk mozzarella look white, some manufacturers add titanium dioxide or peroxides. Dunkin' Donuts used the same trick to make its powdered sugar extra white—until consumer complaints led to its removal.

Where Does Milk Come From?

All mammalian species make milk, but few will ever be recruited for cheese. Milk from horses and camels does not coagulate properly, and most other mammals are not the right size or temperament for the demands of the dairy industry. Most are

too small to produce much milk, and some are too large and dangerous.

Roughly nine million cows are on U.S. dairy farms at any given time, a number that is gradually falling as breeders and pharmaceutical manufacturers find ways to push each cow to produce more milk. Holsteins—the common black-and-white cows you see in pictures—each produce more than 2,800 gallons (11,000 liters) per year. Occasionally, dairy farmers use Jerseys (light brown with white patches) and, less commonly, Brown Swiss, Ayrshires, Guernseys, and other breeds whose milk is less plentiful but is higher in fat and protein.

Italian mozzarella comes from the milk of water buffalos. Goats and sheep make high-fat, high-protein, high-cholesterol milk used for feta and other popular European cheeses.

In the United States, nearly all milk is pasteurized—that is, it is briefly heated to knock out disease-causing bacteria. Some cheese enthusiasts prefer unpasteurized “raw milk” cheeses, but these products cannot be sold in interstate commerce in the United States.

Bring on the Bugs

With the vats now filled like milky wading pools, the next step is to add bacterial cultures. The bacteria ferment the milk sugar, *lactose*, to produce lactic acid, which contributes to the flavor of cheese.

What kind of bacteria? For a mild product, cheese makers use strains that produce lactic acid and not much else. For other varieties, they add cultures that produce various flavors and perhaps bubbles (to make holes). And they might eventually add molds and yeast, adding scents and tastes of their own.

Some bacteria are particularly stinky. Take *brevibacteria*, for example. This bacterial genus is ubiquitous. They are all over

your skin and down your socks. If you haven't washed your feet in a while, it's those overgrowing *brevibacteria* that make people open the windows.

Brevibacteria are used to produce Muenster, Limburger, and several other cheeses, as we saw earlier. If these cheeses smell like unwashed feet, it's because you're smelling precisely the same thing.

Some cheese cultures include *Staphylococcus epidermidis*, one of the bacterial species responsible for human B.O. If you're hungry for details, the bacteria produce isovaleric acid (3-methylbutanoic acid), which imparts a characteristic odor to the human armpit and to some strong cheeses.

One of the compounds often produced during cheese making—*butyric acid*—is also produced when your stomach acid digests food, which is why, to many people, Parmesan has a faint odor of vomit.

As the cheese-making process proceeds, milk fats and proteins break down into a wide variety of chemical products, one of which is *skatole*. If you notice a slight off-odor (let's face it, cheese does not smell like roses), that is because *skatole* is also responsible for part of the odor of human feces (it is produced from tryptophan in the human intestine). The U.S. military has also used *skatole* for its nonlethal "stinkbomb" "malodorant weaponry" designed to temporarily incapacitate the enemy. But you can get it without a military contract. It is in ordinary cheese.

The human nose is exquisitely sensitive to bacterial decomposition, alerting us to food that has gone bad as well as to fecal contamination and other unclean things. But it is precisely the scents of decomposing food, unwashed feet, B.O., and human waste that end up in cheese.

Calves' Stomachs or Genetic Engineering?

Okay, our milk is standardized, pasteurized, and color-adjusted, and bacteria have been busily fermenting it. Now, it's time to coagulate it, turning fluid milk into solid curd. To do this, cheese makers add *rennet*—enzymes that break apart milk proteins and fats. Traditionally, rennet was taken from calves' stomachs, and Widmer's still uses this source. The liquefied calf extract looks a bit like tea as it is poured into the mix.

Most cheese makers use genetically engineered rennet. In 1990, the U.S. Food and Drug Administration approved the process in which enzyme-producing genes are inserted into bacteria and fungi, which, in turn, produce rennet. And some cheeses are coagulated without rennet, using plant extracts or—in the case of cream cheese, paneer, and other soft cheeses—citric acid, vinegar, and similar acids.

Rennet causes the curds to form, and the watery *whey* is then drained off. And that presents a new challenge, especially for large-scale cheese makers. What do you do with all that useless whey? Cheese factories put out tons of it, and it will take quite a landfill to handle that load of cheese factory waste.

As it happens, the dairy industry found a market for whey. Packed in a tub, whey protein is heavily promoted to body builders who can be induced to pay top dollar in hopes that it will pump up their muscles.

Forming and Salting

Time to pour the curds into a form—a round one to produce a wheel, a rectangular one to produce a block. These *forms* have also produced names for cheese: In Italian it is *formaggio*, in French *fromage*.

To make brick cheese—a Wisconsin original invented in 1877—Widmer’s cheese makers pile on actual bricks, squeezing out the last bits of water and whey protein. And, yes, they use the same bricks that Granddad used.

Along the way, salt is added to stop bacterial growth and add flavor. As we will see in the next chapter, a surprising amount of salt ends up in every slice of cheese you’ll find at the store.

Widmer’s cheese blocks then go into the curing room, where warm, humid conditions encourage bacterial growth. Over the next week, the surface will be washed daily with bacteria, then the bricks are wrapped in parchment and foil for sale.

Human Cheese?

You might be wondering if it is possible to make cheese from human milk. The answer is no—at least, not very well. It is too low in the casein protein that is abundant in cow’s milk, and does not coagulate especially well. But that has not stopped people from trying. At Klee Brasserie in New York, *Iron Chef* champion Daniel Angerer made cheese from a 50:50 mixture of cow’s milk and his wife’s breast milk before the New York Health Department made him stop.

At a New York art gallery, art student Miriam Simun offered three varieties of cheese made from milk donated by breast-feeding mothers. It was not a hit. A writer for the *Village Voice* wrote, “There is something fundamentally disgusting about it . . . No one knows what the effect of human breast milk on adults will be. The milk contains a complex mixture of nutrients, hormones, and antibodies formulated by Mother Nature not for adults, but for the youngest babies.”

Which raises the obvious question: If it is so disgusting to make cheese from human milk, is cow’s milk any better? After

all, it was produced in the body of a cow for her baby, not for humans of any age. Does it affect health, too?

I'm glad you asked. Stay tuned. We'll tackle exactly that question in due course.

Endless Varieties

There are, of course, countless varieties of cheese that differ from each other based on the animal species they come from, the bacterial cultures used, the aging process, and other factors.

Cottage cheese and cream cheese are coagulated with acid, using little or no rennet. They retain a bit of lactose sugar and are not aged, which is why their flavors are mild.

Ricotta (Italian for “recooked”) is made from whey, rather than casein.

Feta is traditionally made from sheep’s milk or a combination of sheep’s and goat’s milk.

Although mozzarella traditionally comes from the milk of water buffalos, as we saw above, in the United States it is made from cow’s milk. Thanks to its use on pizza, it has overtaken Cheddar as the number-one cheese in America.

Camembert and Brie, from northern France, are made with bacteria, mold, and yeast that contribute their own smells and flavors—objectionable to some, addictive to others. Only one small Camembert factory remains in the village of Camembert. Fromagerie Durand is happy to show you its cows standing in thick manure and the process of turning their milk into cheese.

Roquefort, Gorgonzola, and Stilton have mold introduced into their interiors. Roquefort is made with sheep’s milk, Gorgonzola and Stilton with cow’s milk.

Emmental (or Emmentaler), from Switzerland, is famous for its holes (“eyes”), which are the result of bacterial cultures producing carbon dioxide gas.

In medieval times, Edam’s red outer color came from turnsole dye, according to Michael Tunick, a U.S. Department of Agriculture cheese scientist. Rags soaked with dye were hung over pans of urine. The urine’s ammonia heightened the color of the dye, which was then rubbed onto the cheese. Today, the cheese’s color comes from a red wax coating.

Limburger, born in what is now a region of Belgium, Germany, and the Netherlands, is famous for its pungent smell. Steve, who is one of my colleagues at the Physicians Committee, recalled his Limburger experiences, which started during a teenage summer job. He handled maintenance duties at a summer camp for high school kids at Lake Como, Pennsylvania, mowing the lawns, fixing broken light switches, and basically keeping the place running. One day, he was asked to take one of the camp administrators for a ride into town.

Steve hopped in the driver’s seat. The camp administrator buckled into the passenger seat, and the two set off. A few minutes later, a death-like smell filled the car. Only later did they find out that Steve’s shop boss, an inveterate practical joker, had put a block of Limburger on Steve’s exhaust manifold.

Not long thereafter, Steve decided to pledge to a college fraternity in Bloomsburg, Pennsylvania. That meant hazing: nineteen days and twenty nights of physical and mental tests and various humiliating and sometimes dangerous experiences. And most memorable of all was *Cheese Night*. The young would-be frat members lined up outside the frat house in front of a table stacked high with—you guessed it—Limburger. The challenge: Eat it. Eat it until you throw up! Which, in Steve’s case, was not long.

Cheddar is the bestselling cheese outside the U.S. and is



**AMANDA'S LIMBURGER CHEESE COSTUME
PAID OFF HANDSOMELY.**

made with a process called *cheddaring*. Widmer's will gladly show you how they do it. But cheddaring did not begin in Wisconsin. It began in Cheddar.

In Somerset, a two-hour drive west of London, the village of Cheddar has three schools, a supermarket, and a long string of stores catering to tourists, along with a deep, picturesque gorge and huge caves. That's where, a thousand years ago, the world's favorite cheese was born. Just one cheese factory remains today.

But the folks at the Cheddar Gorge Cheese Company will show you the process that starts anew each morning.

Similarly to the production of other cheeses, milk goes into a huge vat and is briefly heated. In go the bacterial cultures, followed by rennet to coagulate the milk into a semi-solid mass. The nascent cheese is then cut, allowing the whey to rise to the surface. The mixture is heated again, and the bacterial fermentation process swings into high gear, creating lactic acid. The watery whey mixture—containing protein and sugar—is then drained off to be fed to pigs.

The curds are shoveled onto a cooling table, and this is where cheddaring begins. Big slabs of curd are cut, turned, and stacked one on top of the other. The process is repeated over and over, allowing more whey to be drained away as the curd firms up.

The cheese makers add salt—lots of it—then shred the slabs and pour them into large paint can-sized steel molds and press them, squeezing out more whey. The cheese is then removed from the molds, scalded in water for a smooth outer surface, then put back into the molds to be pressed again, and then again—three times in all. Eventually the cheese is ready to be aged and sold.

Leaping Maggots

A certain species of fly, *Piophilha casei*, is especially fond of decomposing protein, like corpses and cheese. In Sardinia and Corsica, cheese makers encourage the flies to lay their eggs on a sheep's milk cheese called *Pecorino*. As the maggots hatch, they digest the cheese, producing a liquefied mass called *casu marzu* ("rotten cheese"). Diners spread it—maggots and all—on flatbread, then hold their hands over the sandwich to avoid being struck by the leaping larvae. They wash it down with red wine.

Process Cheese

Enough about Cheddar, feta, Camembert, and maggots. What about good old American *process cheese*? You can thank James L. Kraft for it. In 1916, the Kraft Foods founder patented a method for blending old, unsold cheese with younger cheese and adding various ingredients to improve its flavor, color, texture, and shelf-life. (And, yes, it's called "process cheese," even though most people now call it "processed.")

Today, there are many variants, each with its own legal name. But there is one particularly important variety, which I discovered as a college student on a sightseeing trip to Mexico. Stopping into a local restaurant just south of the border, we ordered cheese tostadas—crisp tortillas covered with a spiced cheese topping.

"This is delicious," I said to the server. "What is it?" What Mexican secret tradition was in this amazing dish? I was envisioning some magically prepared cheese carefully spiced to perfection.

"It's Velveeta," he said.

Yes, Velveeta.

That quintessential American food was invented by Emil Frey, a Swiss cheese maker who went to work for the Monroe Cheese Company in New York. He had already created an American version of Limburger, called *Liederkrantz*, and, in 1918, he combined leftover and broken bits of cheese with whey and other ingredients to make a smooth, meltable product. He launched the Velveeta Cheese Company in 1923, and four years later, it was gobbled up by Kraft Foods.

Today, Velveeta is made with milk, whey protein, milk fat, food starch, and other ingredients, along with annatto and apocarotenal for color.

And Now the Problems Start

Cheese is tasty, in an old-socks kind of way. Lots of people love it. So, apart from the occasional leaping maggot, what harm could it do? Well, have a look at what the cheese-making process actually does:

- First, it concentrates calories. A cup of milk has 149 calories; a cup of melted Cheddar has close to a thousand (986, to be exact). If you're thinking metric, 200 grams of milk has 122 calories; 200 grams of Cheddar has 808.
- Second, it concentrates dairy proteins, particularly casein. For some people, these proteins trigger respiratory symptoms, migraines, arthritis, skin conditions, and other problems.
- Third, it concentrates cholesterol and saturated fat, the "bad fat" that raises cholesterol levels and increases the risk of heart disease and Alzheimer's disease.
- As if all that were not enough, there is enough salt in cheese to contribute to high blood pressure. Along with it, cheese contains a variety of chemicals, from hormones to opiates, that makes it a product like no other.

All of which makes an important point: Cheese is a heavily processed food. If you look askance at spaghetti or bread because they are *processed*, that is, they are made from grains that are—gasp—*ground up*, think for a minute about cheese. Cheese is the ultimate processed glop.

Cheese started life as grass. The protein, calcium, and other nutrients in those blades of grass went down the hatch of a

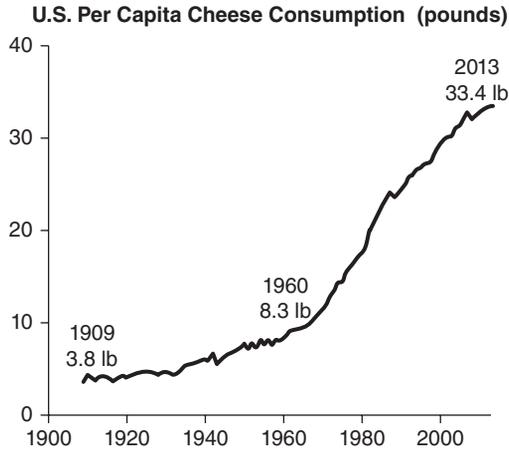
cow. Passing through the cow's stomachs and digestive tract, those nutrients were transformed by stomach acid and various enzymes and eventually found their way into the cow's body and eventually into the milk. The milk was then pasteurized, fermented by bacteria, coagulated with enzymes, separated into solids, salted, and aged, during which time it was further metabolized by bacteria or other germs. Later, it might be added to a pizza or a casserole, only to be baked and salted again. It's hard to find a more heavily processed product.

The Yellow Tsunami

In 1909, the U.S. Department of Agriculture began tracking American eating habits. In that year, the average American ate less than 4 pounds of cheese *in a year* (3.8 pounds, to be exact). Cheese was really a European product back in those days. It was not what we ate in Peoria, and it had no effect on the American waistline.

But things changed. In the 1960s, fast-food chains cropped up like weeds, and there was not a burger that a grill cook couldn't slap a slice of cheese on. After these first yellow ripples, the tsunami arrived. It was called pizza.

Pizza in restaurants, schools, and grocery freezers brought tons of cheese to American plates. Unlike a traditional Italian pizza that uses a sprinkling of cheese as a flavoring (or sometimes no cheese at all), American pizzas are essentially delivery vehicles for ever-deeper layers of gooey cheese. By 2013, the average American's annual cheese intake had climbed from less than four pounds in 1909 to more than 33 pounds. That's roughly 30 pounds of extra cheese this year, next year, and the year after that.



Source: U.S. Department of Agriculture, Economic Research Service, [http://ers.usda.gov/data-products/food-availability-\(per-capita\)-data-system/.aspx#26705](http://ers.usda.gov/data-products/food-availability-(per-capita)-data-system/.aspx#26705). Accessed November 14, 2015.

What does 30 extra pounds of cheese mean, measured in calories? Take a guess.

Maybe a thousand? No, there are more calories than that in just *one* pound of cheese.

Maybe ten thousand? Twenty thousand? Actually, the 30 pounds of cheese that the average American has added to his or her annual diet hold *55,000 calories*. You could drink a can of Coke every day and not get to 55,000 calories. That's 55,000 extra calories this year, the same again next year, and the same every year, if not more. In the next chapter, we will see exactly how cheese makes us fat, but by now you're already starting to get a sense of why it packs on the pounds.

Who is making all this stuff? The United States is. America is, by far, the world's leading cheese producer, with Germany a distant second and France in third place.¹ But when it comes to *exports*, France and Germany are numbers one and two. The U.S. is not even in the top ten. We eat it all ourselves.

In the chapters that follow, we will look at how this peculiar, processed, fatty invention affects our waistline, the surprising ways it triggers health problems, and why it keeps us hooked. And we will look at how to tackle these problems, with an especially detailed look at how to enjoy truly delicious food and get the best of health in the bargain.