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## *In Defense of Food*

Join best-selling author Michael Pollan on a fascinating journey to answer the question: What should I eat to be healthy? Cutting through confusion and busting myths and misconceptions, *In Defense of Food* shows how common sense and old-fashioned wisdom can help us rediscover the pleasures of eating and avoid the chronic diseases so often associated with the modern diet.

Pollan's journey of discovery takes him from the plains of Tanzania, where one of the world's last remaining tribes of hunter-gatherers still eats the way our ancestors did, to Loma Linda, California, where a group of Seventh Day Adventist vegetarians live longer than almost anyone else on earth, and eventually to Paris, where the French diet, rooted in culture and tradition, proves surprisingly healthy. Along the way he shows how a combination of faulty nutrition science and deceptive marketing practices have encouraged us to replace real food with scientifically engineered "food-like substances." And he explains why the solution to our dietary woes is in fact remarkably simple: *Eat Food, Not Too Much, Mostly Plants*.

*In Defense of Food*, a new two-hour documentary from Kikim Media, premieres Wednesday, December 30, 2015, 9:00-11:00 p.m. ET on PBS. Michael Schwarz and Edward Gray produced the film, Schwarz directed it and Gray wrote the telescript. Kiki Kapany is the executive producer.

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Almost every day there's a new headline about food. Eat more fiber. Drink less milk. Eggs are bad. Eggs are good. No wonder people are confused. *In Defense of Food* begins with an exploration of what most Americans eat today —the Western Diet — which includes lots of meat, white flour, sugar, and vegetable oils. It's cheap, convenient, and has been processed to taste really good. But the effects of the Western

diet on health are not so tasty, including alarming increases in obesity and Type 2 diabetes.

"The food industry has gotten incredibly good at manipulating the properties of food," says Kelly Brownell, dean of Duke University's School of Public Policy. "It has just the right texture, just the right color, just the right smell to make you consume as much as possible, miss it when you don't have it, and crave it to the point where you want to keep coming back for more."

Perhaps the biggest threat to our health today comes from a nutrient we seem powerless to resist. "Sugar is appearing in foods that were never sweetened

before,” Pollan points out, including bread, condiments and even “healthy foods” like yogurt. And soda, which often costs less than milk or bottled water, is marketed as a beverage to have with meals or give to children. But flooding our bodies with sugary beverages packs on calories that lead to obesity. And consuming all that sugar can also trigger big surges of insulin into our bloodstreams, which over time, some scientists say, can push this vital hormone to the breaking point and increase our risk of developing Type 2 diabetes.

According to former New York City health commissioner Thomas Farley, “The people who are suffering the most in the obesity epidemic today are the poor and minorities.” In New York City the rates of diabetes for African Americans and Latinos is twice as high as that of whites. “That’s not because of their genes,” he adds. “That’s because of the marketing in those low-income neighborhoods of food that’s bad for people.”

### Lessons from Nature



So if the Western diet makes us sick, what kind of diet will make us healthy? Pollan’s search for the answer takes him toward food that comes from nature and the beginning of life.

Mother’s milk — considered the perfect food — supplies everything that an infant requires. In 2006, Bruce German, director of the Health Institute at the University of California Davis, was puzzled by the curious fact that about one-third of human milk is composed of a class of sugars that babies can’t digest. Why would mothers feed something seemingly useless to their babies? Dr. German and his colleagues wondered if those sugars might be useful to the bacteria that live in babies’ intestines. After multiple tests they finally found the one and only bacterium that would grow in human breast milk — bifidobacterium *infantis* — a bacterium that they discovered helps breast-fed babies by preventing germs that could cause disease from attacking their intestinal linings. “At that point we began to realize the genius of milk,” says Dr. German.

The “genius of milk” shows how well nature provides for us — and how hard it is for foods we manufacture to be as good as what nature provides.

And what nature provides is remarkably diverse. In the Andes, the Quechua people harvest potatoes and grains and eat only a small amount of meat. In East Africa, the Masai thrive on a diet consisting mostly of cattle blood, milk and meat. In the Arctic, the Inuit have long eaten tremendous amounts of fat from whales, seals and fish. And in Tanzania, members of the Hadza tribe are some of the last people on earth who still get their food the way our ancestors did: by hunting and gathering. Scientists who study the Hadza have found that they don’t develop the

diseases found in those who eat the Western diet, like cancer, obesity, Type 2 diabetes and heart disease.

## Eat Food



What Pollan means by telling us to “eat food” is to eat what people ate for thousands of years before we became dependent on processed foods.

The manufactured products that make up so much of the Western diet are found in the center aisles of our supermarkets. Pollan calls these products “edible food-like substances.” Real food can be found on the outer perimeter of the store. “You don’t have to be a scientist to know how to eat,” says Marion Nestle, professor of nutrition at New York University. “Just go around the outside of the supermarket and pick up fruits, vegetables and meat, and stay out of the processed foods, because they’re fun to eat once in a while, but they shouldn’t be daily fare.”

Saying we should eat food sounds obvious, but much of today’s food industry is built on a different idea — that what really matters is eating the right *nutrients*. Manufacturers bombard us with claims about the good nutrients they’ve put in their products and the bad ones they’ve taken out, a way of thinking known as “nutritionism.”

Pollan believes that nutritionism is one of the reasons that something as simple as eating has become so complicated, and points out that the nutrients that science identifies as good or bad have changed a lot over time.

During the late 19<sup>th</sup> century, Dr. John Harvey Kellogg, one of America’s most talked-about health experts, thought protein was bad for people. In the 1890s, he and his brother Will who were vegetarians, invented flaked cereal in an effort to lure people away from the prevailing American breakfast of bacon and eggs. Celebrities including Henry Ford, Amelia Earhart and future President Warren Harding, eagerly submitted to the strange treatments Kellogg prescribed at his celebrated health spa in Battle Creek, Michigan — including all-grape diets and even yogurt enemas. But eventually Kellogg’s theories about the perils of protein were proved to be false.

“Now we’re looking at gluten the way they looked at protein,” Pollan points out. “We have millions of Americans looking to remove gluten from their diet. We’re looking for answers. We’re looking for dietary salvation. And when someone comes forward with a theory we fall into line.”

The campaign to reduce fat in the American diet is the best example of how nutritionism can steer us wrong. When scientists began searching in the 1950s for the cause of what seemed to be a big increase in heart disease, fat got the blame. The Senate Select Committee on Nutrition held hearings and issued a set of guidelines that urged Americans to reduce fat in their diet. For the food industry, the new guidelines provided an opportunity to market new products that were in fact lower in fat — but often much higher in sugar.

Prodded by health experts, the food industry also encouraged consumers to switch from butter to margarine. But in order to make margarine hard enough to spread, it had to be hydrogenated, a process that altered some of the cholesterol-lowering polyunsaturated fats it contained into a kind of fat called trans fat. Consumers were told that trans fat was a healthy alternative to saturated fat.

But in the 1990s, scientists discovered that trans fat was in fact not healthy at all. “As it turns out people who had more trans fat in their diet had higher rates of heart disease and diabetes,” says Dr. Walter Willett, Chair of the Department of Nutrition at the Harvard School of Public Health. And many of the new low-fat, high-sugar products, Willett and his colleagues found, were helping to drive increases in obesity and Type 2 diabetes.

By becoming so obsessed with a single nutrient, a tremendous public health mistake was made. Scientists now understand that a healthy diet has to do with a lot more than one kind of food or nutrient. But eating well isn’t always easy, especially for the millions of people who live in low-income neighborhoods where so much of what’s available is processed food.

Stephen Ritz, founder of the Green Bronx Machine, a nonprofit organization in New York City that teaches young people to grow, eat and love vegetables, spells out the problem: “If you go shopping across the street you’ll be able to purchase a wide variety of cigarettes, chocolates, soda, malt liquor and potato chips. People make decisions based on what they can afford. And sadly, what they can afford, often, is cheap food.”

At the Institute of Food Technologists Expo in Chicago, attended by people from companies like Kraft and General Mills, food products being developed for tomorrow are showcased by scientists. “There’s no question that processed food is convenient and often tasty,” observes Pollan. “But when it comes to health, the claims manufacturers use to sell their products are frequently confusing, if not deceptive.”



## Eat Mostly Plants

In the United States, Seventh Day Adventists have the longest life expectancy of any group. Founded back in the 19th century, the church has always emphasized healthy living. Many Adventists abstain from smoking and alcohol, and about fifty percent are vegetarians.

Scientific studies have backed up their dietary practices, showing that the more red meat you eat, the greater your risk of heart disease, diabetes and certain cancers. But scientists haven't yet been able to figure out for certain what it is about red meat that causes problems. Nevertheless, they agree that eating less meat and more plants is good for you.

Dr. Stephen O'Keefe, a gastroenterologist and colon cancer specialist at the University of Pittsburgh, spent many years working in Africa, where he saw few cases of colon cancer. When he moved back to the U.S. he was struck by the fact that African Americans have one of the highest rates of colon cancer in the world.

O'Keefe realized that the factor most strongly associated with the difference in colon cancer rates between Africans and African Americans was diet. Africans tend to eat more vegetables, fruit, beans and whole grains. Those plant-based foods contain lots of fiber, substances our bodies can't digest. And fiber keeps us healthy by feeding bacteria in our colons.

To investigate just how rapidly a change in diet might affect the factors that give rise to colon cancer, O'Keefe had a group of African Americans in Pittsburgh and a group of people in South Africa swap their everyday diets. After only two weeks, the amounts of harmful compounds increased in the colons of the Africans, while the levels of protective compounds increased in the colons of African Americans.

## Not Too Much



Pollan admits that the most challenging part of his mantra may be the last three words: "Not too much." "The wonderful human institution of the meal — this time where people stop what they're doing, sit down at a table and eat socially — is in trouble," he says. "We eat at our desks. We eat while we're driving. We eat while we're walking down the street."

At Cornell University, Brian Wansink, an expert on eating behavior, demonstrates how environmental factors we may not even notice— for example, plate size, or the order in which foods are served — cause people to eat more than they should. He shows us how simple changes in these things can modify consumption.

*In Defense of Food* reveals that social engineering to control food isn't new. "Government policy has determined the kind of food system that we have," says Marion Nestle. "It determines what food products get supported and which ones don't. So what those of us who are advocating for a healthier food system are after is not getting the government involved in food policy. It already is. We just want it tweaked so that the government role in food policy is to produce a food system that promotes health."

In an effort to stem the rise in Type 2 diabetes and obesity, several municipalities have pursued different strategies to reduce sugar consumption. In 2012, Richmond, California citizens defeated a ballot initiative that would have taxed sugary beverages. That same year, New York's Mayor Michael Bloomberg attempted to limit the size of soda servings, but his proposed regulation was struck down by the courts.

In both instances, food companies spent millions to stop these initiatives. But in 2014, the citizens of Berkeley, California succeeded in passing the first soda tax in the nation's history. "If we discover that works, and in turn we find rates of obesity and Type 2 diabetes moderating or declining, we will have discovered a very powerful tool," Pollan says. "It may or may not work, but I'm delighted that finally we're going to get to try this."

### The French Paradox



One of the most striking lessons in how eating less is good for us comes from observing the French. The seeming conflict between the kinds of food they favor and their relative good health has given rise to a mystery known as the "French Paradox." "They eat very fatty foods very often. They have lavish, lush desserts. They drink lots of wine," Pollan says. "And it drives us crazy, but they're not as fat as we are, and they have less heart disease, and slightly better longevity. How could this possibly be? They're breaking all our rules of eating."

One of the biggest differences between how the Americans and French typically eat is that less food is served in France. Smaller portions are the tradition. In addition, the French much more often eat meals together with others, and spend more time eating and savoring food. Americans, on the other hand, are some of the fastest eaters on the planet.

Concludes Pollan: "There are many aspects of our lives where we feel like we have very little power. But when it comes to food, we do have power. The rise of farmers markets, the rise of organic agriculture, the rise of the food movement —

none of this was the result of government action. All of this was the result of consumers voting with their forks, signaling to farmers and the food industry they wanted something different. And this has created a multi-billion dollar alternative food economy. So we may be at a turning point.”

“Eat food, not too much, mostly plants, is what our species has done for hundreds of thousands of years,” he adds. “So that advice is about as universal as any advice you could offer. It’s very rare in our lives where the answer to a complicated question is so simple, but when it comes to eating, it is.”





Eat only foods that will eventually rot.

Eat only foods that have been cooked by humans.

Avoid foods you see advertised on television.

Eat mostly plants.

Treat meat as a flavoring or special occasion food.

If it came from a plant, eat it. If it was made in a plant, don't.

Eat your colors – that is, eat as many different kinds of plants as possible.

Use smaller plates and glasses.

Serve the vegetables first.

Make water your beverage of choice.

Stop eating before you're full.

Eat more like the French do.

Try to spend as much time enjoying the meal as it took to prepare it.

Don't eat anything your great-grandmother wouldn't recognize as food.

Break the rules once in a while.

***In Defense of Food***  
**Participants (in order of appearance)**

**Anthony Scavotto** was referred to a program for overweight kids at Boston Children's Hospital after gaining 30 pounds in one year.

**Nancy Scavotto** is Anthony's mother.

**David Ludwig**, M.D., is a pediatrician, director of the Optimal Weight for Life Program at Boston Children's Hospital, and the author of *Always Hungry*.

**Kelly Brownell** is dean of Duke University's School of Public Policy.

**David Kessler**, M.D., was commissioner of the U.S. Food and Drug Administration from 1990-1997.

**David Jacobs** is a professor at the University of Minnesota School of Public Health.

**Rima Apple** is an historian and the author of *Mothers and Medicine* and *Vitmania: Vitamins in American Culture*.

**Catherine Price** is the author of *Vitmania: Our Obsessive Quest For Nutritional Perfection*.

**Joseph Hibbeln**, M.D., is a research psychiatrist at the National Institutes of Health.

**Susan Allport** is the author of *The Queen of Fats*.

**Robert Lustig**, M.D., is a pediatrician, a professor at the UCSF School of Medicine, and the author of *Fat Chance*.

**Walter Willett**, M.D., is Chair of the Department of Nutrition at the Harvard School of Public Health.

**Thomas Farley**, M.D., was New York City Health Commissioner from 2009-2013.

**Hodari Davis** is a member of the Bigger Picture Campaign, which brings together young poets and health care workers in the San Francisco Bay area to highlight the problem of diabetes.

**Erica Sheppard McMath** is a poet who works with the Bigger Picture Campaign. A video of her poem "Death Recipe" is featured in the film.

**Bruce German** is the Director of the Health Institute at the University of California at Davis.

**Daniele Barile** teaches at UC Davis.

**David Mills** is a professor of food science and technology at UC Davis.

**Alyssa Crittenden** is an anthropologist at the University of Nevada.

**Marion Nestle** is a professor of nutrition at New York University.

**Sarah Tracy** is an associate professor of the history of medicine at the University of Oklahoma. She is currently writing a biography on Ansel Keys.

**Paul Rozin** is the former editor of *Appetite*, and a professor of psychology at the University of Pennsylvania.

**Joan Gussow** is Professor Emerita of Nutrition & Education, Columbia University.

**Joan Sabaté**, M.D., is a professor at the School of Public Health at Loma Linda University.

**Stephen Ritz** is founder of the Green Bronx Machine, a nonprofit in New York City that encourages young people to grow, eat and love vegetables.

**Chef Bill Peacock** is head of the kitchen at JVL Wildcat Academy in the Bronx.

**Luis Novoa**, a South Bronx resident, is a JVL Wildcat graduate and assistant chef.

**Colin Garner** is a former executive at Rice Bran Technologies.

**Polly Olson** is an executive at Davisco Foods.

**Adam Waehner** is an executive at Cargill, one of the world's largest food companies.

**Christopher Gardner** is a professor of medicine at Stanford University.

**Erin Bird** is the Summer Camp Director at Full Circle Farm in Sunnyvale, California.

**Carol and Richard Nelson**, both in their 90s, are Seventh Day Adventists and residents of a retirement home in Loma Linda, California.

**Stanley Hazen**, M.D., is a cardiologist and Chair of the Department of Cellular and Molecular Medicine at the Cleveland Clinic

**Ellsworth Wareham**, M.D., a vegetarian Seventh Day Adventist, was a heart surgeon for more than five decades.

**Stephen O’Keefe**, M.D. is a gastroenterologist and colon cancer specialist at the University of Pittsburgh.

**Jeffrey Gordon**, M.D., is the Director of the Center for Genome Sciences and Systems Biology at Washington University School of Medicine in St. Louis.

**Jeff Leach** is the founder of the Human Food Project.

**Brian Wansink** is a professor of marketing at Cornell University and the author of *Slim By Design* and *Mindless Eating*.

**Sandi Swearingen** is director of food services at the Lansing Central School District, Lansing, NY.

**Claude Fischler** is a sociologist at the French National Centre for Scientific Research in Paris.

## About Michael Pollan

Michael Pollan is the author of *Cooked: A Natural History of Transformation* (2013) and four *New York Times* bestsellers: *Food Rules: An Eater's Manual* (2010); *In Defense of Food: An Eater's Manifesto* (2008); *The Omnivore's Dilemma: A Natural History of Four Meals* (2006) and *The Botany of Desire: A Plant's-Eye View of the World* (2001). *The Omnivore's Dilemma* was named one of the ten best books of 2006 by both *The New York Times* and *The Washington Post*. A young readers edition called *The Omnivore's Dilemma: the Secrets Behind What You Eat* was published in 2009.

In 2011, Pollan published an illustrated version of *Food Rules* with new paintings by Maira Kalman. *The Botany of Desire* received the Borders Original Voices Award for the best non-fiction work of 2001, and was recognized as a best book of the year by the American Booksellers Association and Amazon.com. A two-hour documentary based on the book and produced and directed by Michael Schwarz premiered on PBS in fall 2009. Pollan is also the author of *A Place of My Own* (1997) and *Second Nature* (1991).

Pollan was named to the 2010 *TIME* 100, the magazine's annual list of the world's 100 most influential people, and was named by *Newsweek* as one of the top 10 "New Thought Leaders" in 2009. A contributing writer to *The New York Times Magazine* since 1987, his writing has received numerous awards. His essays have appeared in many anthologies, and his articles have appeared in major publications including *Harper's Magazine* (where he served as executive editor from 1984 to 1994), *National Geographic*, *Mother Jones*, *The Nation*, *The New York Review of Books*, *Vogue*, *Travel + Leisure*, *Gourmet*, *House & Garden* and *Gardens Illustrated*, among others. In 2009 he appeared in the documentary *Food, Inc.*, which received an Academy Award nomination.

In 2003, Pollan was appointed the John S. and James L. Knight Professor of Journalism at UC Berkeley's Graduate School of Journalism, and the director of the Knight Program in Science and Environmental Journalism. In addition to teaching, he lectures widely on food, agriculture, health and the environment. Michael Pollan, who was born in 1955, grew up on Long Island, and was educated at Bennington College, Oxford University, and Columbia University, from which he received a Master's in English. He lives in the Bay Area with his wife, the painter Judith Belzer, and their son Isaac.

## In Defense of Food Credits

Producer and Director	<b>Michael Schwarz</b>
Producer and Telescript	<b>Edward Gray</b>
Executive Producer	<b>Kiki Kapany</b>
Narrator	<b>Michael Pollan</b>
Editors	<b>Rhonda Collins</b>
	<b>Gail Huddleson</b>
Director of Photography	<b>Vicente Franco</b>
Sound	<b>Ray Day</b>
Illustrations	<b>Maira Kalman</b>
Animation	<b>Ekin Akalin</b>

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The National Science Foundation  
Where Discoveries Begin

### About the Filmmakers

**Michael Schwarz (Producer and Director)** founded Kikim Media with his wife Kiki Kapany in 1996. His work has been honored with the most prestigious awards in broadcasting — including three national Emmy Awards, two George Foster Peabody Awards, the Alfred I. duPont-Columbia University Journalism Award and the Grand Prize in the Robert F. Kennedy Journalism Awards for Coverage of the Disadvantaged.

In addition to *In Defense of Food*, Schwarz is also currently directing *The Valley*, a three-hour cultural, intellectual, and technological history of Silicon Valley; and *The Ornament of the World*, a two-hour history of medieval Spain.

Other recent projects include: *The Botany of Desire*, based on Michael Pollan's book about the relationship between plants and people; *Capturing Grace* (executive producer), the unlikely story of what happens when the world-renowned Mark Morris Dance Group and people with Parkinson's disease join forces to create a unique performance; *Extreme by Design*, a film about students building a better world, one product at a time; *My Father, My Brother and Me (FRONTLINE)*, a chronicle of Parkinson's disease; and *Hunting the Hidden Dimension (NOVA)*, the story of fractal geometry.

As a Fulbright Fellow in the 1980s, Schwarz conducted documentary production workshops in Malaysia, India, Sri Lanka, Indonesia and Papua New Guinea.



**Edward Gray (Producer and Telescript)** is a three-time Emmy Award winner, a two-time winner of the Writers Guild of America Award, and a recipient of both the Edward R. Murrow Award and the Robert F. Kennedy Journalism Award. A producer, director and writer, he has worked with such award-winning journalists as Seymour Hersh, Thomas Friedman and Peter Jennings.

Gray has made more than a dozen documentaries for national broadcast on public television, including *Alaska, The World and Wally Hickel*, the story of the iconoclastic Interior Secretary who was fired by Richard Nixon; *Security vs. Liberty*, a look at post-9/11 counterterrorism policies for the PBS series *America At A Crossroads*; *Through Many Lives: The Aging Brain*, for the series *The Secret Life of the Brain*; and *The Orphan Trains*, for the *American Experience* series. Gray worked with Michael Schwarz and Kikim Media as a co-producer on *The Botany of Desire* and *Hunting the Hidden Dimension*.

For ABC News, Gray was senior producer and co-writer of *Peter Jennings Reporting: The Kennedy Assassination—Beyond Conspiracy*. He spent three years as a staff producer and writer in the TV production unit of *The New York Times*. Gray lives in New York City.

**Kiki Kapany (Executive Producer)** combines a background in media and law (J.D. '86). Her experienced legal sense, paired with a sound creative approach to production on a worldwide scale, adds a key dimension to Kikim's resources. Kapany manages all of the entertainment law and day-to-day business required in Kikim's operations, including overseeing business development, strategic planning, finance and administration. Her expertise extends to the creation and management of major production budgets, extensive image research, grant reporting, organizing project deliverables and managing all production and post-production logistics for a wide variety of projects.