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Health & Medicine

How Do We Change the Way We Eat?

Our industrialized food system is harming our health and warming the planet. Columbia experts weigh in on solutions.

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On July 16, 1976, as America celebrated its bicentennial year, a dozen farmers gathered at a parking lot at East 59th Street and Second Avenue in Manhattan to start a different sort of revolution. They lined up their trucks and unloaded wooden bushels of produce: tomatoes, radishes, carrots, rainbow chard. This was the city's first Greenmarket, which urban planner Barry Benepe had conceived as a way to bring fresh food to New Yorkers while allowing regional farmers to sell directly to customers, eliminating middlemen and saving small farms.

Adrian Benepe '81JRN, the founder's son, who was nineteen at the time, was visiting the market that day. "It was this amazing moment where people came out of the woodwork, five deep around all the stands, grabbing at the produce," says Benepe, who would eventually become New York City's parks commissioner and later president of the Brooklyn Botanic Garden. "There was this desperate yearning of people to physically connect with the food."

Barry Benepe had worked on his own father's two-hundred-acre farm on Maryland's Eastern Shore, and he knew the taste of a field-grown tomato. That's what he wanted to give New Yorkers — that connection to the earth in the form of Ulster County strawberries, Sullivan County cauliflower, and the intensely green greens of the Black Dirt Region in Orange County, with its rich, loamy soil. He knew that buried under the cans, boxes, plastic containers, and shrink-wrap of the American diet was a primal hunger for something real.

The Greenmarket idea, conceived in the afterglow of the first Earth Day in 1970 and the publication in 1971 of Frances Moore Lappé's *Diet for a Small Planet* (which weighed the ecological and social costs of animal agriculture and endorsed a plant-centric, whole-foods diet), grew faster than wild arugula and helped seed the farm-to-table movement. Fifty years later, there are forty-eight Greenmarket locations in the city.

There are also twice as many humans in the world, and Lappé's small planet has become a hot one — due in significant part to how we feed ourselves.

"Global food systems generate about 30 percent of all greenhouse gases, mainly as methane emissions from cattle," says Jessica Fanzo, a professor of climate at the Columbia Climate School and the director of the Food for Humanity Initiative, a network of Columbia scholars working on food-systems research and pedagogy. "Industrialized food systems are the biggest users of freshwater resources and the number-one driver of deforestation and biodiversity loss, since you have to clear land to raise and feed billions of animals."

Most of these animals (cows, pigs, chickens, turkeys) live and die on factory farms, also known as CAFOs (concentrated animal feeding operations), and are turned into any number of nutritionally dubious food products. "Most people don't eat steaks and fresh chicken breasts," Fanzo says. "They're eating these processed meats — bacon, Spam, bologna, sausage — which are associated with heart disease and colorectal cancer." The journal *Health Affairs* says poor nutrition costs the US $1.1 trillion a year in health-care spending and lost productivity.



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As for agriculture, Fanzo notes that more than half of all farmland in the US is devoted to commodity crops like corn and soy that are used to feed livestock, and that most of the grains and produce that Americans eat are grown on large-scale farms, where synthetic pesticides and fertilizers and exhaustive farming techniques result in soil degradation, water pollution, and habitat loss. The food system as a whole is caught in a cycle in which the warming produced by factory-farm emissions helps intensify climate-related weather events — heat waves, droughts, floods, wildfires, untimely frosts — that can result in crop failures. According to the American Farm Bureau Federation, farmers suffered $22 billion in crop and rangeland losses in 2023 due to severe weather and natural disasters.

A nutritionist by training, Fanzo studies agricultural systems and how climate affects people’s ability to eat healthily. Her research has taken her to impoverished rural regions in Africa and Asia — in Kenya, Uganda, Ethiopia, Nepal, Timor-Leste, Cambodia, Thailand, and Vietnam — where agriculture is most deeply affected by climate change. Even as she helps communities adapt their systems to provide healthy, sustainable food, Fanzo worries that rising global wealth could lead to the spread of an American-style model of more meat, more processed foods, and more

intensive, damaging farming methods. And she thinks the US would do well to remember its own agricultural roots.

“Many solutions are already on the table,” Fanzo says. “We know how to make agriculture more sustainable. Better soil management and organic practices have been tried and tested.” Fanzo sees government subsidies as a tool that could be used to promote cleaner, healthier farming methods on a mass scale. “The US government pays farmers to meet certain quotas for dairy and meat, which makes them affordable. Why not shift those subsidies to horticulture in the next farm bill?” The farm bill, a sprawling piece of legislation covering farming and food aid, is renewed roughly every five years. “Why not,” says Fanzo, “give subsidies to organic farmers?”

“How do we produce food for ourselves and for each other that’s actually healthy and not destructive?”

Mark Bittman, a food journalist and lecturer at the Mailman School of Public Health, agrees that the federal government, to fulfill its fundamental purpose of advancing the public good, has a responsibility to act. “We need a food policy that changes the way land is distributed, changes the way farmers and workers are paid, and makes food better and more accessible,” says Bittman, who is the author of thirty books, including the bestsellers *How to Cook Everything* and *VB6: Eat Vegan Before 6:00*. “How do we produce food for ourselves and for each other that’s actually healthy and not destructive?

“The answer is that we need to see food differently — not as a profit source but as a nutritional source in every sense: food production should nourish the land and the people.”

But with an administration intent on sidelining climate scientists, developing fossil fuels, subsidizing large farms at the expense of small ones, and speeding up production in meat-processing plants, where does that leave us? What can ordinary citizens do to transform a system that touches every part of human life?

Bittman, who improved his own health through his VB6 diet (plant foods by day, then anything you want in the evening), calls for the sort of local activism that makes food justice a central issue.

“Universal access to nutritious food should be seen as a fundamental right,” Bittman says. “It’s as important as anything else you can name, and understanding that, and acting on it, is central to our well-being.”

Change always starts with a seed. In the case of Joan Dye Gussow ’75TC, that seed was planted in her backyard, and from it sprang a garden of ideas that would nourish the “eat locally, think globally” sustainable-food movement, with its emphasis on organic practices (no synthetic pesticides or fertilizers) and the cultivation of nutrient-rich soil.

A longtime professor of nutrition education at Teachers College, Gussow grew vegetables at her home in Congers, New York, in the 1960s, and later in nearby Piermont. What started out as a money-saving alternative to the bland offerings at the grocery store led her to reflect on the shrinking number of small farms and the widening gulf — geographical, spiritual — between people and their food sources. Her ideal was for people to live in proximity to where their food was grown, so that they ate more healthily and thoughtfully, with an understanding of how food is produced.

Gussow, who died this past March at ninety-six, was one of the earliest critics of the modern food system and influenced a generation of food thinkers, including author Michael Pollan ’81GSAS (Pollan credits his dictum “Eat food. Not too much. Mostly plants.” to Gussow’s inspiration). She insisted that real nutrition wasn’t about percentages on a label; it was about eating whole foods grown in healthy soil.

“Joan believed that we need everyone to be ‘food citizens’ who understand where food comes from so that they can make informed decisions,” says Pam Koch ’00TC, an associate professor of nutrition and education at Teachers College and Gussow’s former student. “Telling people about what nutrients are in food doesn’t change eating habits. But if you help them understand the production side and why that matters, you can get them to change how they eat.”

Koch took up that mantle. Her doctoral dissertation argued for more plant-based foods — vegetables, whole grains, beans — in school meals. Her experiment, which she implemented in two New York City schools, was to have kids cook recipes in the classroom, learn about the history of the food and why it’s healthy, and then serve it for school lunch. “We basically found that the kids who cooked the food were the ones who ate it when it was served in the cafeteria,” says Koch. “Joan had predicted,

correctly, that if kids cook food, they'll eat it, because they're more connected to it."

Today, Kate MacKenzie '02TC is putting Gussow's legacy into action. As executive director of the New York City Mayor's Office of Food Policy, MacKenzie oversees the food systems in city institutions, including hospitals, prisons, shelters, senior centers, and schools. "Our objective is to deliver healthy, delicious, culturally appropriate meals to New Yorkers," MacKenzie says. That means limiting red meat and introducing whole-food proteins and more plant-based options. "No one likes government telling them what to do," says MacKenzie. "So you nudge. You offer choices."

Wanting to develop a culture of healthy eating, MacKenzie's office created a "food education road map," a plan to give city students access not just to healthy food but also to programs that teach them about the entire food system — production, processing, distribution, marketing, consumption, waste — and its effects on the environment and communities. To close the sustainability loop, MacKenzie and her team are working with New York farmers to procure locally grown food — apples, potatoes, carrots, corn, beans, and more — for city institutions, including schools.

At Columbia, Vicki Dunn, the assistant vice president of dining, is proud that Columbia was the first organization to take up the Plant-Powered Carbon Challenge, which MacKenzie's office launched in 2023 to help private institutions lower their food-related carbon emissions. A student-led study at Columbia that year showed that while red meat made up 13.4 percent of Columbia Dining's purchased products, it accounted for 72 percent of its carbon footprint. So the University committed to reducing its food emissions by 25 percent by 2030. Instead of beef Bolognese, says Dunn, there is now mushroom-and-lentil Bolognese. There are butternut-squash-and-portobello quesadillas. There is chickpea tagine with apricots. And oat milk is the default at the coffee stations. No one, says Dunn, is complaining.

Experts agree that large institutions are a good vehicle for driving societal change. "We need to be thinking about the purchasing decisions that all of our institutions make," says Anna Lappé '01SIPA, the daughter of Frances Moore Lappé and the executive director of the Global Alliance for the Future of Food, a group of philanthropies working toward food-system reform.

Anna Lappé's food education started early, at home — though it didn't necessarily take place in the kitchen. "While food was my mother's life's work, it was always

more about the politics of food than any culinary practice," Lappé says. "My memories aren't of cooking with her; they're of her taking me to protests in San Francisco to hear farmworker advocates, or of stuffing envelopes to fundraise for her nonprofit."

"Our choices do add up. Are they everything? No. But are they something? Yes."

You might say that the Lappé didn't fall far from the tree. Lappé *fille* is the author of *Diet for a Hot Planet: The Climate Crisis at the End of Your Fork and What You Can Do About It*, published in 2010, when "there was very little conversation at any level — municipal, state, national, or global — on the connections between the climate crisis and our food system," Lappé says. Taking up her mother's ecological themes, Lappé examines the greenhouse-gas footprint of processed foods (including the packaging) and busts a few myths, such as that industrial farming methods are necessary for feeding the world (she provides examples of high-yield organic farms and their community benefits) and that a whole-foods diet is a pricey luxury. "I showed that a diet of beans and grains and leafy greens, even if they're organic, can be much more affordable than eating packaged foods," Lappé says. "The bigger issue is having access to fresh foods — and then having the time to cook."

As Lappé notes, some twenty million Americans live in so-called "food deserts" — low-income areas that lack fresh, healthy, affordable food options. But even at megastores like Walmart or Target, or supermarket chains like Kroger or Publix, where most Americans shop for food, unhealthy choices and deceptive labels ("all-natural," "farm-fresh") abound. The stores decide what to carry on their shelves based not on what's healthy or sustainable but on what's profitable.

Jonathan Rubin '20SIPA knows the game firsthand. At Columbia, he studied vertical farms — indoor structures that cultivate produce without soil, mostly using water and artificial light — and later ran his own vertical farm in Florida. He sold his hydroponic leafy greens through the biggest food distributors and supermarket chains in the country.

"The supermarket will say to a local distributor, or to the farmer in California, 'We want your product in Fort Lauderdale within forty-eight hours. We want it in New York City. We want it in Chicago,'" Rubin says. "That's nice, but the problem is that it takes time for food to grow — and things grown in soil are seasonal. So the system has created these high demands that are not natural.

“That means that the supermarket chains want products that will look nice, smell nice, and ship well after three months. You could have the most beautiful strawberries, but if they’re going to go bad in two weeks, the supermarket won’t want them, because they can’t get them to stores in time. And if you as a small grower can’t keep up with demand, you typically won’t get a contract. Being a small farmer is a very difficult game to play.”

And that’s apart from the weather.

On April 4, 2022, climate scientist Peter Kalmus ’08GSAS and three colleagues, all wearing white lab coats, chained themselves to the entrance of the JPMorgan Chase bank in downtown Los Angeles. They were protesting that institution’s massive funding of new fossil-fuel projects.

“We were trying to draw attention to how it’s not just the fossil-fuel industry that’s destroying our planet — it’s also this network of supporting industries, including banks,” Kalmus says.

The LAPD arrived. Kalmus, who studies how ecosystems and humans will respond to rising temperatures, recalls helicopters and a lot of police in riot gear. Video of the arrests got millions of views online.

“To me, the science suggests we need really urgent action,” Kalmus says. “I don’t understand how anyone can do the science, or even just know the science, without trying to pitch in and do something. So that’s why I’m an activist.”

For years, Kalmus had focused on how his own daily activities meshed with food, transportation, and clothing systems to form his personal carbon footprint. This led to his 2017 book *Being the Change: Live Well and Spark a Climate Revolution*. “But then I realized that while it was fun for me to change how I interacted with those systems, it wasn’t going to help very much.” So Kalmus started helping other scientists organize to do direct action, which he has found to be “a more impactful way to approach the problem.”

The climate clock ticks loudly in Kalmus’s ears, and he sees the food system — far beyond the transportation sector — as offering the clearest opportunities for meaningful emissions reduction. “As a global society of humans who care about having a livable planet, probably the easiest thing we could do, essentially

overnight, to help stop or reduce irreversible planetary overheating would be to eliminate the beef industry."

Kalmus concedes that it's radical and that people don't want to hear it because they love eating beef. "I don't blame them," he says. "But the fact is, if we stopped beef production, nobody would die. Nobody would starve. In fact, more people would eat. Some people would have to find different jobs, but we would be better positioned to feed the global population, because it takes an incredible amount of primary production to feed those cattle and then for people to eat that cow."

While the experts concur that the government must act, and that the onus for changing the food system cannot lie with consumers — "We are not going to shop our way out of a thorny, systemic global crisis like climate change," says Lappé — no one denies the power of individuals to make a dent.

"I was raised on *The Lord of the Rings*," says Zoe Adamopoulos, a graduate student in sustainability at the School of Professional Studies, "and I very much believe that no matter how big or small you are, you can make an impact." Five years ago, Adamopoulos watched a documentary about CAFOs that exposed the conditions of the animals confined in factory farms and the health problems of humans who lived near them. Moved, she embraced veganism, a philosophy that seeks to avoid harming animals and excludes animal-based foods. Before entering Columbia, Adamopoulos, who is twenty-six, spent four years as business-development manager for TiNDLE, a food-tech company that makes plant-based meat alternatives.

Last spring, Adamopoulos took Fanzo's Food Systems and Climate Interactions class, and over the summer she worked with Fanzo's Food for Humanity Initiative. "The faculty want to investigate alternative proteins — everything from plant-based fermentation to cultured cell-based meat," Adamopoulos says. "I'm helping to figure out what the landscape is and how Food for Humanity can fit into it and develop more sustainable proteins."

Adamopoulos acknowledges the inherent privilege of her position. "Millions of people don't have access to plant proteins or produce," she says. "That's a terrible problem. But for people like me, who live in the heart of Manhattan, it's much easier to find plant-based options. In my worldview, having privilege means having a moral responsibility to look at your consumption habits and say, 'Maybe I can just eat a

little less meat.’”

“Our choices do add up,” says Lappé. “Are they everything? No. But are they something? Yes. If I have access to food that is better aligned with the climate and biodiversity, then sure, I want to make those choices. It’s also better for my body, and it’s better for my kids.”

“Choosing what to eat is one thing many of us can control,” says Fanzo. “You can make choices based on your values. If you care about your health, if you care about animals, if you care about the environment, if you care about small farmers, and you have the ability to make a choice based on that, then you have power. And if everyone takes that power into their own hands and votes with their forks, it does add up. It matters.”



Heirloom tomatoes at the Columbia Greenmarket. (Len Small)

Every Thursday and Sunday, farmers drive their trucks and vans to the Columbia Greenmarket, which stretches along the east side of Broadway between 114th and 115th Streets. There, under white canopies, the farmers set out their goods: New York blueberries and cherries, squashes of gold and pale green with fun variety names (Eight Ball, Zephyr, and pattypan), bunches of Tokyo bekana cabbage, boxes

of shishito peppers, purple Italian eggplants, bulbous spring onions, carrots like thick orange fingers, a half dozen kinds of apples (Melrose, Braeburn, Pink Lady), pink and purple potatoes, and bright red radishes.

When Barry Benepe started the Greenmarket program, his main environmental concern, according to son Adrian, was to preserve the land that would inevitably fall to developers if a farm were to fail. But Barry, who, like Joan Gussow, died this year at ninety-six, happened to conceive of a food model for the climate-change age. It's worth remembering that in 1975, a year before the first Greenmarket, Columbia geochemist Wally Broecker '53CC, '58GSAS published his seminal paper "Climatic Change: Are We on the Brink of a Pronounced Global Warming?," in which he presciently described how trapped gases in the atmosphere would raise global temperatures.

Half a century later, farmers face the ravages of global warming as well as hundreds of billions of dollars in cuts to the Supplemental Nutrition Assistance Program (SNAP), which more than forty million Americans rely on — including the many Greenmarket customers who buy produce with SNAP coupons.

Tough times, to be sure. And it's here, at the market, with a farmer behind a table, that the power of one becomes evident: each customer's purchase helps keep a farm alive.

One farmer, from Kinderhook, New York, sets out a box of red-and-green McIntosh apples. Asked what the hardest part of farming is these days, he doesn't hesitate: "The weather."

The apples are juicy, a tangy blend of sweet and tart, fragrant of the orchard.

Food, as Fanzo often says, is both a victim and an instigator of climate change. But here, under the canopies on upper Broadway, piled high in wooden crates, it bears the seeds of a solution.

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