

Don't believe the hype: Organic produce is not healthier than conventionally-grown fruit and vegetables

This year marks the 20th anniversary of the U.S. Department of Agriculture starting to implement its organic food rules. They allow companies to feature a “USDA Organic” seal on their packaging. This seal of approval has helped the U.S. organic food market expand from [less than \\$8 billion in sales in 2000](#) to [more than \\$50 billion](#) in 2019. But as the market has grown, so have the falsehoods about organic food.

It's useful to remember what the “organic” designation was – and was not – meant to be. The goal was simply to fortify trust in the fast-growing but fragmented organic food market. “Let me be clear about one thing,” said Dan Glickman, the Clinton Administration’s Secretary of Agriculture who oversaw the organics designation. “It is not a statement about food safety. Nor is ‘organic’ a value judgment about nutrition or quality.”

But through clever (and often misleading) marketing, a halo effect has developed around organic food. Its advocates frequently tout the food as safer, healthier, and better for the environment than conventional food, and that's one reason many people are willing to pay the [higher prices](#) that organics command. The claims have also helped shape public opinion: [A 2018 Pew poll](#) found 45 percent of U.S. adults surveyed — and 54 percent of those aged 18-29 — believe that organic fruits and vegetables are healthier than conventionally-grown produce. The reality is quite different. The claims that organic food is safer, healthier, and better for the environment are simply false.

Organic chemical bazaar

The key determinant of whether something qualifies as organic is something rather mundane: the production method. For crops, the origin of the seed is key — it must be organically grown and cannot be the product of genetic engineering (e.g. GMOs or gene editing). There is a widespread impression that organic food is grown without chemicals — and [seemingly-credible outlets](#) contribute to this impression.

The reality is that all farmers — both organic and conventional — use both chemical and non-chemical containment methods. More than 100 fertilizers and inputs (pesticides, insecticides or fungicides) are authorized by organic farming regulations in both [Europe](#) and the [United States](#).



Credit: Gary Pilarchik/The Rusted Garden

Organic regulations were designed to promote the use of natural chemical over synthetic ones. But many natural chemicals don't work well controlling pests. And even though the absence of synthetic pesticides is often cited in support of organics, the reality is that organic farmers have gotten approval from USDA to use dozens of synthetic chemicals, [from vaccines for animals to pheromones](#) to confuse insects. Also permitted are non-synthetic pesticides, which can be less effective than synthetic pesticides and thus need to be [deployed at a higher level than in non-organic farming](#).

All pesticides — synthetic or not — must meet identical safety standards. And when used appropriately, approved chemicals, synthetic or natural, do not pose meaningful health risks. Thus the [conclusion](#) of food scientists at the University of California-Davis: "The marginal benefits of reducing human exposure to pesticides in the diet through increased consumption of organic produce appear to be insignificant."

Organic health myth

Another misleading claim is that organic products are inherently "healthy" or, at the very least, "healthier" than non-organic food. One obvious rejoinder to this idea is the existence of many products with no redeeming health qualities that have nonetheless secured the USDA's organic certification. This includes [potato chips](#), [ice cream sandwiches](#), and even some [cigarettes](#). As is often pointed out, organic junk food is still junk food.

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There's also rigorous research that calls into question the superior health benefits of organic food. [Researchers at Stanford University](#) sifted through 237 research papers and found little evidence that organic foods are healthier than conventional alternatives. "Some believe that organic food is always healthier and more nutritious. We were a little surprised that we didn't find that," [said Crystal Smith-Spangler](#), a Stanford Medicine instructor and one of the paper's authors.

The Stanford findings echoed another [review of 137 studies](#) published in the *American Journal of Clinical Nutrition* in 2009 and commissioned by the UK Food Standards Agency.

These studies comport with what many other experts have said. Organic and conventionally grown foods are "really similar for vitamins, minerals, and carbohydrates," [notes](#) the head of nutrition at the Harvard-affiliated Brigham and Women's Hospital. Even a news site devoted to touting organic food [acknowledges](#) that there is "not nearly enough [evidence] to make categorical claims" about organic food being "nutritionally superior" to non-organic food. As for restaurants marketing their organic offerings (and likely charging more in the process), *caveat emptor*. There's no certification process for restaurants' use of "organic" and [investigations](#) have turned up examples of self-proclaimed "organic" restaurants serving food that doesn't comply with the federal rules.

The misguided belief in organic food's health benefits can also be harmful to human health. The "organic" label on cigarettes [has been found](#) to reduce perceptions of their ill effects. Similarly, a [study](#) by two University of Michigan professors found that some people believed that consuming organic food made exercise less important.

Is organic farming more sustainable?

The fallback position for many "natural" food advocates is that organic is clearly better for the environment than conventional food. But this too is a myth.

Consider something basic such as crop yields. As farming and technology have evolved, it's become possible to grow more food on less land. That's a win for the environment. But because the rules governing organic farming prevent the usage of some modern practices, [organic crops don't grow as efficiently](#) and require more farmland for a given amount of food produced. The reduced yield can be much as 34 percent less than for conventional farming, according to [a study published in Nature](#).

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Crop biologist Steve Savage looked at the impact of shifting all U.S. agricultural output to organic. The [analysis](#), published by the Genetic Literacy Project, found that compensating for organics' lower efficiency would require the cultivation of more than 100 million additional acres — a land mass larger than the entire state of California.

Savage points out that “organic farming is not the best way to farm from an environmental point of view. [T]here are now several cutting-edge agricultural practices which are good for the environment, but difficult or impossible for organic farmers to implement within the constraints of their pre-scientific rules.”

What about climate change?

Organic farming is particularly problematic when it comes to addressing climate change. A [recent study](#) in *Sustainability*, a peer reviewed journal, slammed organics for their lack of innovation related to climate change impact, citing higher greenhouse gas emissions from increased acreage, as well as organic food companies resisting the adoption of emerging technologies that could curtail harmful emissions.

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Many organic advocates, including politicians in the European Union, promote something called the “Farm to Fork (F2F) Green Deal,” which aims to convert much of Europe over to organic production in the next decade. But this would be a climate change disaster, say independent scientists. A [2019 Nature study](#) assessed the potential impact on Wales if it met F2F Green Deal objectives. The study found that it would mean a 40 percent yield drag and an increase in greenhouse gas emissions by as much as 58 percent, since more land would need to be tilled to compensate for the production shortfall. Rather than growing enough to feed their own population, European countries would need to begin importing food. The need

for imports would mean increased food production in other countries – an outcome that that would likely result in clear-cutting of tropical forests throughout the world, according to the authors of a [blistering column](#) in *Nature* published last year.

Anti-technology bias

The final rub against organic food is that it heightens fears about the safety of genetically modified organisms. They cannot be included in organic food, which suggests there must be something unsafe about them. Yet [more than 90 percent](#) of U.S. corn, cotton, and soybeans are genetically modified. More than half of GMOs are now grown in the developing world. No reliable study has ever shown any risks from eating GMO food, which have been sold in the United States since 1994. More than 150 Nobel laureates have [attested to](#) the safety of GMO foods.

Genetic engineering helps protect the environment. Gene editing tools such as CRISPR can strengthen pest resistance, increase crop yields, and reduce emissions connected to farming.

Genetically modified crops are the key to promoting agricultural sustainability. Critics of GMO foods ignore that genetically engineered variants have saved entire food categories in Hawaii (papayas), Bangladesh (eggplants), and other many other crops that require disease and pest resistance. A [new potato](#) bred for African farming, eliminates the need for fungicides that are otherwise required to resist a blight that can destroy [up to 60 percent](#) of the potato crop in a country such as Uganda. Efforts to undermine the value of such high-yielding, disease-resistant genetically engineered foods stand in the way of progress and prosperity for African and Asian farmers.

The need for honesty

In the United States, growing numbers of consumers shop at farmers' markets and find it satisfying to purchase food that's grown by small producers who are often local. That's a market-based development and we have no quarrel with it. But locally grown food is not improved by being organic. Food grown with conventional farming techniques is every bit as valuable and nutritious.

At a moment when millions of Americans have saddled themselves with poor diets, it's unfortunate that the organic food movement has spent so many years making inflated claims about their products and demonizing other solutions. The next 20 years will hopefully be marked by greater honesty. In the meantime, we're left with the conclusion of one of the world's leading agronomists, [Louise Fresco](#), a Dutch sustainable food scientist: "Organic farming as a whole is a mish-mash of valuable goals and ideals that have either been insufficiently tested or are completely misguided."

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