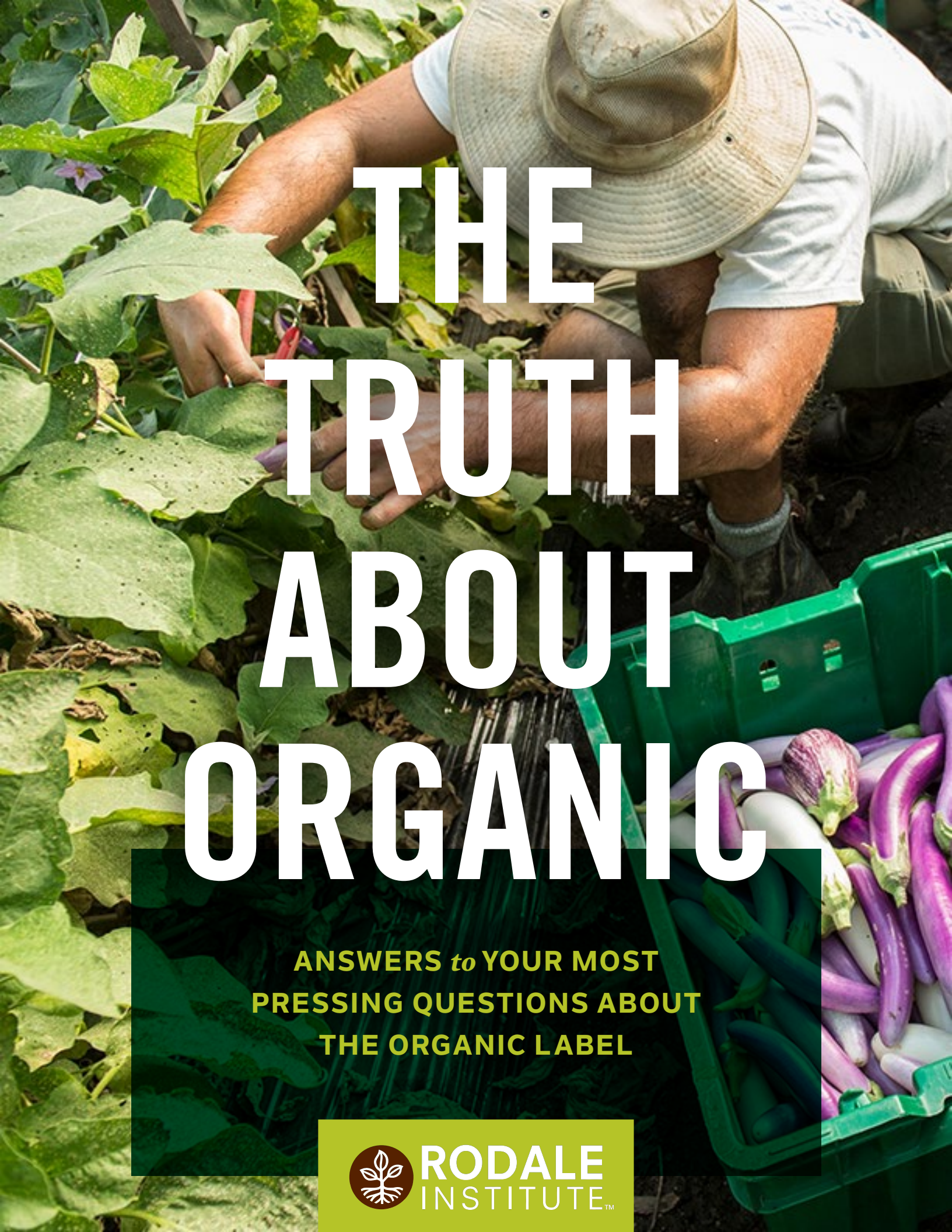


THE TRUTH ABOUT ORGANIC

ANSWERS *to* YOUR MOST PRESSING QUESTIONS ABOUT THE ORGANIC LABEL

RODALE INSTITUTE™

RODALE INSTITUTE

Rodale Institute is a 501(c)(3) nonprofit organization dedicated to pioneering organic farming through research and outreach. Rodale Institute is committed to groundbreaking research in organic agriculture, advocating for policies that support farmers, and educating people about how organic is the safest, healthiest option for people and the planet.

611 Siegfriedale Road, Kutztown, PA 19530
610-683-1400 | RodaleInstitute.org

TABLE OF CONTENTS

WHAT'S THE REAL TRUTH ABOUT ORGANICS?

For as long as people have been growing food, natural and organic methods were the norm. What's new is organic's substantial value in the modern marketplace.

Today more than 82% of American households purchase organic products. As of 2018, the organic market is worth more than $50 billion in the United States alone, and it continues to grow.[1]

In 1954, J.I. Rodale said, "Organics is not a fad." 65 years later, he's proven right.

For more than 70 years, we've been researching best practices in regenerative organic agriculture. Our decades-long Farming Systems Trial has borne out the evidence that organic systems are more resilient, sequester more carbon, yield fewer emissions, require less energy, and can produce yields equal to conventional—if not higher.[2]

Now, we're expanding our research to encompass links between soil health and human health, an area woefully unexplored through long-term trials. We remain objective in our research, but we believe in the power of organic, and we always have.

Even with this tremendous growth, there are still a lot of questions out there about organic. This guide will give real, honest, and clear answers about the biggest questions and myths surrounding organic agriculture, and what it means for you.

WE HOPE YOU ENJOY IT.

Let us know what you think, or ask questions, by connecting with **@RodaleInstitute** on social media.

To learn more, sign up for our email newsletter at **RodaleInstitute.org**.

QUESTION #1

IS THE ORGANIC LABEL JUST A MARKETING SCAM?

Some people think that the organic label is just an excuse to charge more that doesn't mean anything. But that's not the case.

WHAT IS ORGANIC?

Organic agriculture is a production system that regenerates the health of soils, ecosystems, and people. Organic farmers rely on natural processes, biodiversity, and holistic cycles adapted to local conditions.

If you purchase a product with the USDA Organic seal, you can be assured that item was produced **without synthetic pesticides, herbicides, or fertilizers,** and that it is **GMO-free.** Organic also **prohibits dozens of other chemical additives and preservatives.**[3]

As organic grew in popularity, farmers and shoppers wanted a standard that could make things easier for consumers trying to make choices in the grocery aisle.

THE CERTIFICATION PROCESS

Here are some important things to know about certification:

1. The rules for what materials and practices are allowed in organic production are determined by the National Organic Standards Board and the National Organic Program and are reviewed biannually with input from people all over the agricultural spectrum, including farmers and scientists.
2. The public is encouraged to submit their comments on what should be permissible in organic.
3. A USDA Certified Organic label requires a yearly review and audit by a third-party certifier. **Every facet of the farm or business and every material used is examined to make sure it's in compliance.**

Certification is a rigorous process based on frequent collaboration and review of the standards. The USDA Certified Organic seal is a stamp of approval that the farm or business is in compliance, and you can trust it.

CURRENT CHALLENGES

In recent years, updates to the standards (or a lack thereof) have caused concern. Here's what you should know:

1. Organic certification for livestock still isn't as rigorous as it should be. Organic advocates are fighting to ensure stricter rules and enforcement for organic animal management.
2. Hydroponics can be considered organic, even though they are soilless systems. Many farmers feel that soil is the essence of organic and cannot be left out.
3. As organic has become more profitable, there's been an increase in import fraud. That means that some shipments (usually livestock feed) claimed as organic were actually conventional. The most recent Farm Bill has applied specific resources to eliminating fraud.

As more and more labels have entered the marketplace, like Fair Trade, Biodynamic, Non-GMO, Certified Humane, and more, confusion in the grocery aisle has increased.

The bottom line: **no current label is as all-encompassing as USDA Certified Organic.** USDA Certified Organic is the only label that means no synthetic pesticides, herbicides, or fertilizers, and no GMOs—not to mention it prohibits dozens of other additives.

WHAT THAT MEANS FOR YOU

Don't let organic's growing pains deter you. **The USDA Certified Organic seal is still an excellent signpost that the item was produced in a healthy way.**

There are several new certifications emerging that aim to take organic even higher. Keep your eyes open for these "coming soon" labels:

a. **Regenerative Organic Certification:** Regenerative Organic Certification requires eligible farms to be USDA certified organic first. The farms must then implement additional practices to improve soil health, animal welfare, and social justice. Learn more at RegenOrganic.org.

b. **The Real Organic Project:** The Real Organic Project is also an add-on to USDA certified organic. It prohibits hydroponics and upholds high standards for animal welfare and soil health. Read the standards at RealOrganicProject.org.

When it comes to what and how we eat, each of us has more choices available than ever before. Yes, the landscape of organic is changing. But you have the power to enact positive change.

IS THE USDA CERTIFIED ORGANIC LABEL JUST A MARKETING SCAM? ABSOLUTELY NOT.

Organic is based on sound farming practices that protect resources, and it's backed by a rigorous certification process.

QUESTION #2

DO ORGANIC FARMERS SPRAY THEIR CROPS?

ANSWER: YES—BUT NOT THE WAY YOU THINK.

Organic agriculture prohibits the use of synthetic herbicides, pesticides, and fertilizers. So when consumers find out that organic farmers sometimes use sprays and other "inputs," they're understandably confused. Get the full story on how organic farmers deal with pests.

GETTING STRAIGHT ON GLYPHOSATE

Many families choose organic to avoid exposure to toxic synthetic chemicals like glyphosate, the chief ingredient in the weed-killer RoundUp.

Glyphosate is so ubiquitous in our food, water, and air that it is regularly found in human urine.[4]

Organic not only bans synthetic herbicides like RoundUp—it prohibits the use of hundreds of chemical additives, preservatives, colorings, and more.[5]

The key word is "synthetic." Generally, organic farmers use no synthetic (read: man-made chemical) inputs. However, they are allowed to use natural ones. But the story is more nuanced than that.

THE APPROVED MATERIALS LIST

The National Organic Standards Board and the National Organic Program maintain a list of materials that are approved for use in organic production (see Question #1).[6]

Once the NOSB and NOP add a material to the national list, third-party organizations like the Organic Materials Review Institute (OMRI) evaluate new products to make sure they're in compliance.

The general rule for the national list is that **naturally occurring materials are allowed, and synthetic materials are prohibited.** There are, however, exceptions to that rule.

SYNTHETIC VS. NON-SYNTHETIC

Non-synthetic is defined as "a substance that is derived from mineral, plant, or animal matter and does not undergo a synthetic process. Non-synthetic is used as a synonym for natural."

Synthetic is defined as "a substance that is formulated or manufactured by a chemical process or by a process that chemically changes a substance extracted from naturally occurring plant, animal, or mineral sources."

Almost all natural materials are approved for use in organic. Take, for example, neem oil. Neem oil is derived from the seeds of the neem tree. It has been used for hundreds of years to minimize pests and plant diseases. Neem oil is natural and approved for use in organic.

Most synthetics are prohibited in organic—unless there is no naturally occurring alternative. Certain synthetics like copper sulfate have been approved for use in organic for a few reasons:

1. No natural alternative exists that can effectively target the same plant diseases.
2. Copper was determined safe with restrictions on its use by the USDA before approval.
3. Farmers can only use copper once they've exhausted all other options.

In these cases, a certifier will work with the farmer to make sure only the minimum amount of the material is applied. **Preference is always given to biological and preventative methods before a synthetic material is introduced, and exposure is always minimized as much as possible.**

"Approved substances are naturally derived and quickly degrade by weather...lowering the chance of human exposure. Chemical pesticide formulations and other synthetic materials are manipulated in laboratories and are foreign to the human body, which might see the compounds as intruders."

DR. ANDREW SMITH
Rodale Institute Chief Scientist

THE ROLE OF BIODIVERSITY

For more persistent pest issues, organic farmers utilize strategies like introducing natural predators and beneficial insects, crop rotation, natural pheromones, or mechanical controls like trapping. Broad sprays of non-specific pesticides are always a last resort. Healthy soil, from good farming practices, is always the first line of defense.

As the organic industry booms, more large farms are joining the movement, and those large farms sometimes grow just a single crop for efficiency. Complex ecosystems have more natural defenses than monoculture farms.

Because of this, large farms are more likely—though by no means guaranteed—to use more organic-approved sprays. If you are concerned about avoiding even organic-approved sprays, do some research on the farms that grow the produce that you and your family enjoy.

WHAT THAT MEANS FOR YOU

- Organic is a surefire way to avoid the most dangerous chemicals on the market, including glyphosate, which has been implicated in human health concerns like cancer.
- Organic-approved inputs are generally natural and safer than conventional and go through a rigorous review process.
- Organic farmers only use inputs as a last resort.
- If you're concerned about the safety of an approved material, speak up to the NOSB and NOP.
- Organic is about more than pesticides and fertilizers. Organic also prohibits dozens of artificial preservatives and additives.

PHOTO CREDIT: JOHNY GOEREND

DO ORGANIC FARMERS SPRAY THEIR CROPS? SOMETIMES—BUT ONLY WITH THOSE APPROVED BY THE ORGANIC STANDARD BOARDS AND ONLY AS AN ABSOLUTE LAST RESORT.

If you want to minimize your family's exposure to harmful synthetic chemicals, organic is the best choice.

PHOTO CREDIT: ROB CURRAN

QUESTION #3

CAN ORGANIC FEED THE WORLD?

ANSWER: YES—AND MORE.

"Although achieving [this] increase will be challenging, global agricultural output is at least on the right trajectory. In contrast, agriculture's environmental performance is going in the wrong direction: Aggregate impacts are increasing and must drop sharply over the coming decades."[9]

AGRICULTURE IN 2050: RECALIBRATING TARGETS FOR SUSTAINABLE INTENSIFICATION, 2017

With the global population set to hit 9.1 billion by 2050[7], it's true that in the future we'll need to grow more food than ever. But there's a common misconception that organic isn't up to the task.

A LOOK AT THE NUMBERS

Recent research says we need to increase food production by anywhere from 20% to 70% in order to meet demand in coming years.[8]

Yes, we need to produce more food. But more importantly, **we need to mitigate farming's harmful effects on the environment—fast.**

Agriculture accounts directly for 11-13% of greenhouse emissions and indirectly for another 12%.[10] With our climate increasingly unsteady, we can't afford to continue with current methods that erode soil and pollute the environment. That's why the myth that organic food can't feed the world isn't just wrong, it's downright counterproductive.

If we're going to decrease farming's impact—and we must decrease farming's impact—then we need organic. Because farming doesn't only contribute to climate change; it's greatly affected by it. And it is getting harder and harder to grow food in extreme weather.

THE PROBLEM WITH YIELDS

Conventional and organic methods are often compared based on how much crop they yield per acre, leading to farm consolidation in addition to environmental degradation from soil erosion, air pollution, and water contamination.

We hear that in order to feed the world, the only solution is bigger farms with fewer farmers that achieve higher yields with new technologies like chemical fertilizers, pesticides, and GMOs—the conventional American way.

Is a marginal increase in yields achieved by further burdening ecosystems really worth it when other solutions exist?

Organic farmers protect the environment and prioritize soil health, clean and air water, and nutrient-dense foods. Their emphasis is typically less on maximizing crop yields and more on creating healthy, resilient ecosystems.

However, it's untrue that the difference in yields between organic and conventional is drastic, or that organic doesn't ever yield as much as conventional. In fact, organic outperforms conventional in adverse weather conditions like drought by as much as 40%.

CHALLENGES TO CURRENT RESEARCH

Studies claiming that organic yields are less than conventional are generally short-term, meaning they collect data over just a couple years. There is a serious dearth of long-term research on the differences between organic and conventional farming. Organic systems, when transitioning from conventional, need time to rebuild soil health to operate at maximum capacity.

Rodale Institute's Farming Systems Trial, started in 1981, is the longest-running side-by-side trial of organic and conventional in North America.

THE NEXT FRONTIER: NUTRIENT-DENSITY

70% of the crops grown in America are cereal grains, primarily corn and soybeans. The majority of that harvest doesn't go to human food. Boosting yields of these crops isn't going to feed the world.

To truly feed the world, we're going to need more foods that provide complete nutrition and more farmers to grow it.

40 YEARS OF RESEARCH

Our Farming Systems Trial data shows:

1. Organic yields are competitive with conventional yields after a 5-year transition period
2. Organic systems produce yields up to 40% higher in drought
3. Organic methods leach no toxic chemicals into waterways
4. Organic uses 45% less energy
5. Organic releases 40% fewer greenhouse emissions
6. Organic earns 3-6x higher profits for farmers

CAN ORGANIC FEED THE WORLD? YES IT CAN, WHILE ALSO IMPROVING HUMAN HEALTH AND THE ENVIRONMENT.

Organic methods can compete with conventional yields and have huge potential to expand global food production while actively regenerating resources and protecting the environment from pollution and toxic waste. For a healthy future, we can't afford anything less.

Currently, our food system overproduces grains, fats, and sugars and underproduces the vitamins, minerals, and proteins vital for human health. The nutrition in some fruit and vegetable crops has been declining for decades as we've bred for yields over flavor and health.[11]

The answer to these problems isn't maximum yields of corn and soy—it's more nutritious food grown in a healthier way.

UNTAPPED POTENTIAL

40% of the world's current crop production comes from small farmers in the developing world, and they are poised to make a big difference.[12]

Given tools like viable seed and better crop varieties, these farmers can dramatically increase their productivity. Pair those tools with basic infrastructure and weather information to help time planting and harvest and these small farmers could triple their yields while regenerating resources.

WASTE NOT

More than 800 million people are hungry today despite the fact that we grow enough to provide for the current population.[13] One-third of the food we produce globally gets lost or wasted.[14]

If we're worried about feeding the world, we should spend time making sure the food we do have is used completely and responsibly.

WHAT THAT MEANS FOR YOU

Our growing population needs farming methods that conserve and regenerate resources while generating healthy food—not methods that use more chemicals, polluting the environment in order to grow more corn to feed more feedlot animals.

QUESTION #4

IS MEAT RUINING THE PLANET?

ANSWER: IT DOESN'T HAVE TO.

In the last few decades, factory farms have taken over the global meat supply. Their focus is on maximum production at the cheapest cost—and that comes at the expense of animal welfare and environmental health.

A FRIGHTENING TREND

By 2050, global meat and dairy production is projected to increase more than 150%.[15]

In 2017, the EPA reported that agriculture contributed nearly 10% of all greenhouse gas emissions, and livestock accounted for a full third of that.[16] Animal feed production and processing contributes the bulk of those emissions, with manure next in line.[17]

However, it's a myth that animal agriculture has to be destructive or that we have to stop eating meat to save the planet. It's not the cow, it's the how.

AGAINST THE GRAIN

Cows' and pigs' digestive systems aren't built for grain—they're built for grass. **Perpetual grain feeding leads to health problems that require more antibiotics, leading to higher risks of antibiotic resistance.**

Grain-fed animals also emit more methane. Between 1990 and 2005, U.S. methane emissions from dairy cow manure rose 50%. Pasture-raised animals, on the other hand, produce manure with about half of the potential to generate methane.[22]

Artificial fertilizers and herbicides required for corn and soybeans are also major CO_2 emitters.[23] The result is an increasingly unsteady climate, a food system saturated with toxins like glyphosate, polluted air and water, and a deforested landscape.

THE ORGANIC DIFFERENCE

It's clear: Factory farming isn't working out. The good news is that organic prohibits what factory farming allows.

To be certified organic, livestock farmers have to follow these rules:

- No antibiotics or artificial growth hormones
- Animals must be managed in a way that conserves natural resources and biodiversity
- All feed must be 100% organic, and that means no glyphosate or polluting fertilizers
- Animals must have year-round access to the outdoors

THE POWER OF PASTURE

If we continue to lose soil at current rates, we have fewer than 60 years remaining before global topsoil is depleted.[24]

Smart grazing can help the soil recover and build soil health. Grazing encourages plants to send out more and deeper roots, boosting soil biomass and fertility and sequestering carbon from the atmosphere. As the soil carbon matter increases, so does the land's ability to hold water, preventing erosion and agriculture runoff.

If we applied strategic grazing to just 25% of our croplands and grasslands, we could mitigate the entire carbon footprint of North American agriculture.[25] Grazing animals can utilize marginal land otherwise unable to grow food, bringing those lands back to life.

WHAT THIS MEANS FOR YOU

If you're ready to say no to factory farms and make the switch to regenerative organic meat, look for new labels like Regenerative Organic Certification that consider animal welfare in their standard. Buy local meat and eat vegetarian at restaurants, focusing on organic and regenerative meat when you do choose to eat it.

IS MEAT RUINING THE PLANET? IT COULD, IF WE DON'T CHANGE OUR PRACTICES QUICKLY.

By utilizing regenerative organic methods like rotational grazing and eschewing antibiotics, our meat will be healthier for the environment and for us.

UNFORTUNATE FACTS OF FACTORY FARMING

ANIMAL WELFARE VIOLATIONS

- Animals are often raised indoors under artificial light and crowded in small confinement pens.
- Lack of pasture creates vast "manure lagoons" that contribute to animal disease.

ENVIRONMENTAL VIOLATIONS

- Factory farm manure pits are easily eroded in heavy rain or storms and can leach antibiotics, insecticides, and potential pathogens like salmonella into the water supply.[18]
- Fertilizer used to grow animal feed combined with animal waste runs off into waterways. This creates algae blooms that suffocate aquatic life.

HUMAN HEALTH CONCERNS

- 80% of all the antibiotics produced in the U.S. are fed or administered to livestock.[19] Frequent antibiotic use creates resistant bacteria that could lead to the outbreak of a superbug.[20]
- Factory farms create noxious fumes that pollute the air and degrade quality of life for rural residents, particularly African Americans, Hispanics, and American Indians.[21]

QUESTION #5

IS ORGANIC REALLY THE HEALTHIER OPTION?

ANSWER: WE WANT TO FIND OUT.

SCIENCE SAYS...

Here are some studies that shine light on the question of whether an organic diet is healthier.

- **THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER:** They've classified glyphosate, the common ingredient in the herbicide RoundUp, as a probable carcinogen.[33]
- **INDEPENDENT RESEARCH ON GLYPHOSATE AND THE MICROBIOME:** One report finds that contact with glyphosate can destroy intestinal villi, affecting nutrient absorption.[34] This is linked to the rise of celiac and autism.[35]
- **THE AMERICAN MEDICAL ASSOCIATION:** A population-based study of French men and women over 5 years found a 25% reduction in cancer risk for participants who ate a largely organic diet.[36] The study has been criticized for its largely female sample and for its assessment questionnaire.
- **UC BERKELEY, UC SAN FRANCISCO, AND FRIENDS OF THE EARTH:** Their peer-reviewed study found that switching to an organic diet reduced levels of synthetic pesticides found in the participants by 60.5%.[37]

The last frontier in organic research is determining exactly how organic foods affect human health. And that's easier said than done.

HERE'S WHAT WE KNOW:

- We're using more pesticides and herbicides in our conventional agricultural systems than ever before.[26]
- Cancer rates are on the rise worldwide.[27]
- The International Agency for Research on Cancer (IARC) has classified three common conventional pesticides and herbicides—glyphosate, malathion, and diazinon—as probable carcinogens.[28]
- Incidents of autoimmune diseases have increased significantly worldwide—as much as 7% for some conditions.[29]
- We're spending $3.5 trillion a year on healthcare each year in America,[30] yet the majority of physicians spend less than 3 minutes discussing nutrition with patients.[31]
- 70% of Americans are on at least one prescription medication.[32]

We're treating our food with more chemicals than ever before and we keep getting sicker. Many people choose organic to avoid additional chemical exposure and to fight back against a food and healthcare system that is no longer working.

GETTING A HANDLE ON NUTRITION

Research studies on the effects of an organic diet have been controversial.

Nutrition doesn't exist in a vacuum, with factors like genetics and environmental influences at play, and that makes it hard to study the impact of an organic diet.

However, several studies do indicate that eating organic foods might be better for your health.

SOMETHING IN THE WATER

But what about other factors? We're impacted by more than just what we eat. The air we breathe and the water we drink also affect our immune system and our quality of life.

Organic production not only releases fewer emissions by avoiding nitrogen fertilizers[38]—it also keeps toxic chemicals out of the public water supply. A study in 2017 found neonicotinoids, a conventional insecticide, in treated tap water.[39]

Our own Farming Systems Trial has found that conventional systems leach atrazine, another toxic pesticide, into groundwater.

BRIDGING THE GAP

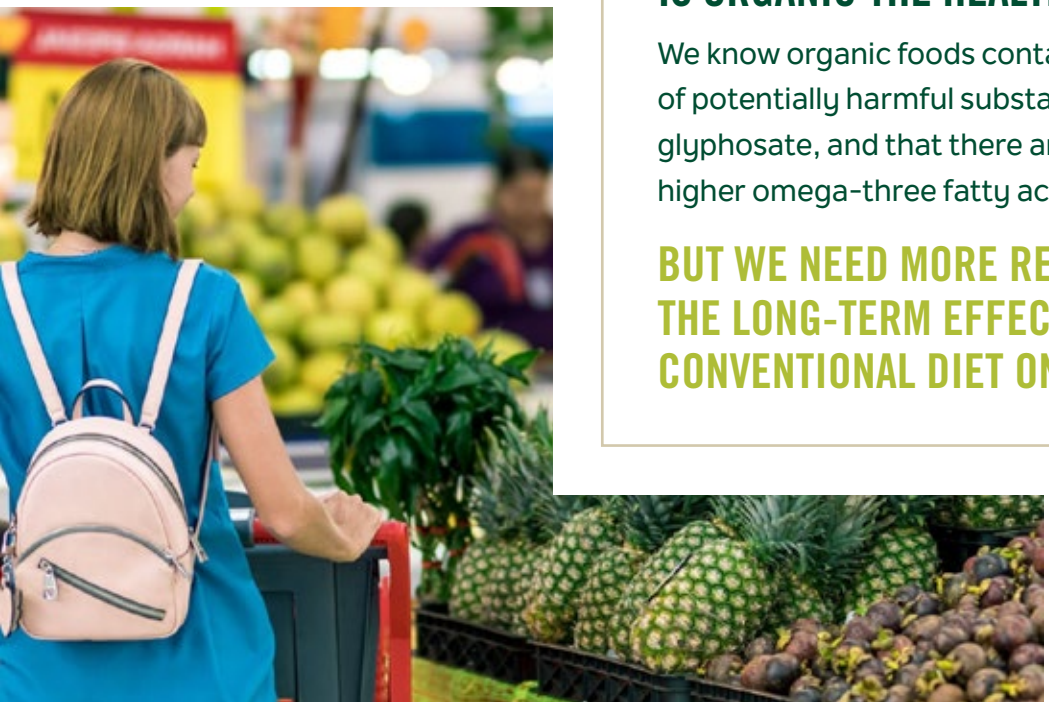
It's difficult to design sound studies on the effects of organic vs. conventional food, and there's an abundance of competing interests.

Rodale Institute's Vegetable Systems Trial is designed to help fill in the gap. In this study, the first of its kind, we're growing conventional and organic crops side-by-side under controlled conditions. We aren't currently studying people, but this long-term research will give us a more accurate picture of any differences in nutrient-density between organic and conventional produce.

This type of controlled, long-term research is critical to future conversations on the links between agriculture and human health.

WHAT DOES THAT MEAN FOR YOU?

We need more research. In the meantime, your health and your family's health are in your hands. You have the power to make informed decisions. An unhealthy planet is unhealthy for everyone on it, and that matters. The choice is yours.



IS ORGANIC THE HEALTHIER OPTION?

We know organic foods contain less pesticide-residues, are free of potentially harmful substances like antibiotics, GMOs, and glyphosate, and that there are some nutritional differences—like higher omega-three fatty acids in organic dairy.

BUT WE NEED MORE RESEARCH TO UNDERSTAND THE LONG-TERM EFFECTS OF AN ORGANIC VS. CONVENTIONAL DIET ON HUMAN HEALTH.

Families considering making the switch to an organic lifestyle understandably have a lot of questions. Is it worth it? What does it mean for my family's health? How am I impacting the planet?

We're here to be your resource. Rodale Institute is backed with facts, science, and rigorous research. We've been studying the effects of organic farming—on your health, on the climate, on water, and for farmers—for more than 70 years.

We hope this guide has given you clear answers to an increasingly complicated food system. Every time you're in the grocery store aisle, or sitting down for a meal, you can vote with your dollars for the type of future you'd like to see for your family and the planet.

TOGETHER, WE HAVE THE POWER TO HEAL THE WORLD.

Learn more about our other research, farmer training, and consumer education initiatives at **RodaleInstitute.org.**

REFERENCES

[1] Organic Trade Association 2017 market analysis https://ota.com/resources/market-analysis

[2] https://rodaleinstitute.org/science/farming-systems-trial/

[3] USDA National List of Allowed and Prohibited Substances https://www.ams.usda.gov/rules-regulations/organic/national-list

[4] Mesnage, Robin, and Michael N Antoniou. "Facts and Fallacies in the Debate on Glyphosate Toxicity." Frontiers in public health vol. 5 316. 24 Nov. 2017. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5705608/

[5] "'Not in Organic' Toolkit." Organic Trade Association. Web. https://ota.com/resources/not-organic-toolkit

[6] "The National List." United States Department of Agriculture, Agricultural Marketing Services. Web. https://www.ams.usda.gov/rules-regulations/organic/national-list

[7] http://www.fao.org/fileadmin/templates/wsfs/docs/expert_paper/How_to_Feed_the_World_in_2050.pdf

[8] https://academic.oup.com/bioscience/article/67/4/386/3016049

[9] https://academic.oup.com/bioscience/article/67/4/386/3016049

[10] 6. Smith, Pete, and Mercedes Bustamante. "Agriculture, Forestry and Other Land Use." The Intergovernmental Panel on Climate Change, United Nations, www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_chapter11.pdf.

[11] https://journals.ashs.org/hortsci/view/journals/hortsci/44/1/article-p15.xml

[12] http://www.fao.org/3/y4252e/y4252e06.htm

[13] https://www.researchgate.net/publication/241746569_We_Already_Grow_Enough_Food_for_10_Billion_People_and_Still_Can't_End_Hunger

[14] http://www.fao.org/save-food/resources/keyfindings/en/

[15] https://link.springer.com/chapter/10.1007/978-3-319-19168-3_8

[16] https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions#agriculture

[17] http://www.fao.org/news/story/en/item/197623/icode/

[18] https://www.wsj.com/articles/florence-flooding-hits-north-carolina-hog-farms-hard-1537398585

[19] Sharma, Shefali, and Zhang Rou. "China's dairy dilemma.'." Institute for Agriculture and Trade Policy: Washington, DC (2014).

[20] https://www.cdc.gov/narms/faq.html

[21] http://www.ncpolicywatch.com/wp-content/uploads/2014/09/UNC-Report.pdf

[22] https://www.osti.gov/biblio/1464240

[23] Steinfeld H, Gerber P, Wassenaar T, Castel V, Rosales M, de Haan C. Livestock's Long Shadow: Environmental Issues and Options. Rome: Food and Agriculture Organization of the United Nations; 2006.

[24] http://www.fao.org/soils-2015/events/detail/en/c/338738/

[25] http://www.jswconline.org/content/71/2/156.full.pdf+html

[26] Benbrook, Charles M. "Trends in glyphosate herbicide use in the United States and globally." Environmental sciences Europe vol. 28,1 (2016): 3. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5044953/

[27] https://www.cancer.org/research/infographics-gallery/rising-global-cancer-epidemic.html

[28] International Agency for Research on Cancer. IARC Monographs Volume 112: Evaluation of Five Organophosphate Insecticides and Herbicides. Lyon, France: World Health Organization; March 20, 2015

[29] Lerner, Aaron & Jeremias, Patricia & Matthias, Torsten. (2015). The World Incidence and Prevalence of Autoimmune Diseases is Increasing. International Journal of Celiac Disease. 3. 151-155. 10.12691/ijcd-3-4-8.

[30] https://www.cms.gov/research-statistics-data-and-systems/statistics-trends-and-reports/nationalhealthexpenddata/nationalhealthaccountshistorical.html

[31] Aggarwal, M., et al (Accepted/In press). The Deficit of Nutrition Education of Physicians. *American Journal of Medicine*. https://doi.org/10.1016/j.amjmed.2017.11.036

[32] https://newsnetwork.mayoclinic.org/discussion/nearly-7-in-10-americans-take-prescription-drugs-mayo-clinic-olmsted-medical-center-find/

[33] International Agency for Research on Cancer. IARC Monographs Volume 112: Evaluation of Five Organophosphate Insecticides and Herbicides. Lyon, France: World Health Organization; March 20, 2015

[34] Samsel, A.; Seneff, S. Glyphosate, pathways to modern diseases II: Celiac sprue and gluten intolerance. Interdiscip. Toxicol. 2013, 6, 159–184

[35] https://www.ncbi.nlm.nih.gov/pubmed/24678255) (https://rodaleinstitute.org/blog/healing-autism-with-organic-food-one-familys-amazing-story/

[36] Baudry J, Assmann KE, Touvier M, et al. Association of Frequency of Organic Food Consumption With Cancer Risk: Findings From the NutriNet-Santé Prospective Cohort Study. JAMA Intern Med. 2018;178(12):1597–1606. doi:10.1001/jamainternmed.2018.4357

[37] Hyland, Carly, et al. "Organic diet intervention significantly reduces urinary pesticide levels in US children and adults." *Environmental research* 171 (2019): 568-575.

[38] Bauer, Susanne E., Kostas Tsigaridis, and Ron Miller. "Significant atmospheric aerosol pollution caused by world food cultivation." Geophysical Research Letters 43.10 (2016): 5394-5400.

[39] https://www.nrdc.org/experts/jennifer-sass/neonic-pesticide-may-become-more-toxic-tap-water