

The Impact of Organic Dairy on Reducing Synthetic Chemical Use

Jessica Shade, PhD

THE ORGANIC CENTER



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How Does Choosing Organic Help Avoid the Use of Synthetic Chemicals?

Every time you pick organic, you are reducing the number of synthetic chemicals that get used. Because synthetic fertilizers, pesticides, and drugs can't be used in organic food, choosing organic helps keep those chemicals out of our farms, waterways, and air – and out of our food!

This is especially true for dairy, because dairy production doesn't just have impacts from the cows that make the milk – it also includes the food those cows eat, and how that food was grown. In organic systems, cows are required to be grazed on pasture throughout the entire grazing season – at least 120 days per calendar year. The pasture they are grazed on must be organically managed, so it can't be sprayed with toxic synthetic pesticides or synthetic fertilizer. When the cows do get feed, that food also needs to be 100% organic, meaning any grain they eat can't contain growth hormones, antibiotics, genetically modified feeds or ingredients (GMOs), or slaughter by-products from mammals or birds.

A CALCULATOR TO LOOK AT THE BIG PICTURE WHEN IT COMES TO PESTICIDE USE

Choosing organic at the grocery store helps prevent the use of pesticides, synthetic fertilizer, and animal drug treatments, but it's easy to feel like each gallon of organic milk or cup of organic yogurt you purchase is only a drop in the bucket when it comes to making a stand against dangerous chemical use. However, when you take each of those organic choices and add them up, the impact is enormous!

ACCESS THE CALCULATOR [HERE](#)

The Organic Center developed a calculator to look at the magnitude of organic dairy purchasing across the country to show you that all those drops add up to big impacts.

The screenshot shows a web browser window with the URL `organic-center.org/calculator-how-does-organic-reduce-chemical-use`. The page title is "CALCULATOR | How does organic reduce chemical use?".

Chemicals that would be avoided if all US milk were organic

If all 26 billion gallons of milk produced in the US each year were organic it would mean:

Fertilizers

The use of synthetic fertilizers in agriculture contribute to a cascade of environmental problems.

7.2 billion pounds of **fertilizers** would be avoided each year.
That's **1.3 thousand** Olympic Swimming Pools full of fertilizer!

Want more fertilizer details?

Pesticides

Synthetic, toxic pesticides negatively impact both the health of the environment and human health.

120.4 million pounds of **pesticides** would be avoided each year.
That's **22** Olympic Swimming Pools full of pesticides!

Want more pesticide details?

Drugs

The use of antibiotics in agriculture contributes to antibiotic resistant bacteria, which contributes to thousands of deaths each year.

9 million ounces of **antibiotics** would be avoided each year.
163.4 million drug treatments would be avoided each year.
61.6 million drug injections would be avoided each year.

Calculator

Current Impact
See how many chemicals are already avoided each year in the US from organic milk production.

Current US Organic Milk Production

What if...
What if all the milk produced in the US were organic? What about yogurt or cheese? See how many chemicals would be avoided each year if the US switched to all-organic:

- If all US milk were organic
- If all US yogurt were organic
- If all US cheese were organic
- If US school lunches were organic

Industry Partners

Are you in the dairy industry and interested in understanding the impacts you have – or could have – from organic?

Enter the gallons of milk used or produced by your company to see the chemical avoidance from organic: *

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What is Organic Dairy?

There are unique regulations that organic poultry and livestock farmers must follow to ensure organic meat is produced sustainably, with the health of the animals and the health of consumers in mind. While there are many distinctions between USDA Organic and non-organic, the main differences are related to what the animals eat, where they spend their time, and how they are treated if/when they get sick.

Here are the specifics:

MANAGEMENT OF ORGANIC COWS

PASTURE ACCESS: Organic cows must be grazed throughout the entire grazing season—at least 120 days per calendar year. The pasture they are grazed on must be organically managed, so it can't be sprayed with toxic synthetic pesticides or synthetic fertilizer. Pasture-based diets are important for animals, because more grass in the ruminants' diet leads to more balance in gut microbes, less acidity in the rumen (which is the largest chamber to process roughages), and overall improved digestive health.

FEEDING AND GRAZING: The diet for organic cows needs to be completely organic, meaning that it can't contain growth promotants of any kind, antibiotics, genetically modified feeds or ingredients (GMOs), or slaughter by-products from mammals or birds. During the grazing season, organic ruminant livestock must get at least 30% of their diet from grazing on organic pasture.





LIVING CONDITIONS: In organic production, the animals' stage of life, the climate, and the environment need to be taken into consideration when providing year-round access to the outdoors. The outdoor environment must include shade, shelter, exercise areas, fresh air, clean water for drinking, and direct sunlight. Continuous total confinement of any animal indoors is prohibited. Yards, feeding pads, and feedlots may only be used to provide ruminants with access to the outdoors during the non-grazing season or for supplemental feeding during the grazing season.

ANIMAL HEALTH: On organic farms, preventive healthcare practices are used to deter illness. If those efforts fail, organic farmers can use other restricted medicines, but antibiotics and most synthetic chemicals are prohibited.

ENVIRONMENTAL HEALTH: Organic farmers and ranchers must use practices that minimize impacts to the environment surrounding the farm. They often recycle manure into crop and pasture production to help avoid nutrient runoff and increase carbon storage in their fields. They also use beneficial farming practices such as crop rotation and cover crops to maintain soil fertility and help protect soil and water quality. Organic production may also have a lower contribution to climate change by reducing greenhouse gas emissions. Synthetic fertilizers or pesticides—leading drivers of climate change within the agricultural sector—are prohibited in organic production.

Organic Dairy Means:

No antibiotics, synthetic growth hormones, GMOs, or pesticides

All livestock feed must be 100% organically produced

Cows are pasture-raised and grazed throughout the grazing season

Organic dairy farmers use holistic, preventive health care practices

The health and natural behavior of animals are prioritized

Organic dairy production helps protect the environment





Conventional Chemicals in Dairy – What are they?

There are three big categories of synthetic chemicals that are used along the dairy production chain: fertilizer, pesticides, and drugs.

Synthetic fertilizers are manufactured nutrients that are a result of chemical processing. They are typically sourced from fossil fuels. While they can include a variety of macro and micronutrients, the three main building blocks are nitrogen, phosphorus, and potassium. In dairy, fertilizer is primarily used in the production of feed such as corn and soy. The overuse of synthetic fertilizers is widespread, and has led to pollution of our waterways, biodiversity loss, soil degradation, and contributed to climate change.

Synthetic pesticides are chemicals that are used for destroying pests. The most common categories of pesticides are insecticides (used for killing insects), herbicides (used for killing plants), fungicides (used for killing fungus), and rodenticides (used for killing rodents). In conventional dairy, pesticides are commonly used in the production, transportation, and storage of feed. In the field, pesticides have contributed to widespread environmental catastrophes, including biodiversity loss, pollinator population collapse, soil health decline, and water contamination, to name a few. When pesticides are used in the production of cattle feed, their residues are consumed by the cows, and can be excreted into milk, resulting in pesticide residues in conventional dairy.

Drug use in conventional dairy production is common. Dairy cattle are often treated with antiseptics, bactericides, and fungicides for skin or hoof infections, cuts, and abrasions; steroid anabolic growth promoters and peptide production enhancers; antiparasite drugs; antibiotics to control diseases and to promote growth; and reproductive aids to increase fertility. Unfortunately, some of these drugs can have dangerous impacts on human health, such as the proliferation of antibiotic-resistant bacteria. Additionally, there is a risk for drug transfer into milk, resulting in drug residues at the grocery-store level in conventional dairy.

What's in My Organic Dairy?

The good news, when it comes to organic dairy, is that choosing organic dairy is an easy way to avoid pesticide, antibiotic, and synthetic growth hormone residues.

A study out of Emory University, in collaboration with The Organic Center, tested conventional and organic milk from store shelves across nine regions of the U.S. and found that a majority of conventional milk samples tested positive for residues of antibiotics and currently used controversial pesticides. Two of detected antibiotics have been entirely banned from dairy production in the U.S., while one sample contained levels of amoxicillin that exceeded the FDA allowable limits. Pesticide residues of pesticides chlorpyrifos, atrazine, permethrin and more were found in 26 to 60 percent of conventional samples but **none of the organic samples**. Finally, residues of growth hormones in conventional milk were 20 times higher than in organic. The results of this study indicate that organic milk is a clean and safe choice for those interested in avoiding synthetic chemicals in their dairy products.





→ WHY IT MATTERS:

Climate Change

Avoiding synthetic chemicals in dairy production can help mitigate climate change by avoiding the energy-intensive processes used to make those chemicals, and replacing them with practices that build soil health and sequester carbon.

Organic dairy means more time on pasture and less reliance on grain for feed. Pasture is made up of perennial grasses that require few inputs to grow year after year, especially under organic management that prohibits synthetic nitrogen fertilizers. By contrast, corn and soy are annual crops that require a lot of energy to produce and transport, emitting a lot of greenhouse gasses in the process. Conventional corn and soy use many inputs that are energy intensive to manufacture and apply such synthetic nitrogen fertilizers, herbicides, and pesticides. These crops also require a lot of fuel for machinery used to plant, harvest, process and transport to dairy farms. This is especially true when feed grain is imported from other countries.






Well managed pasture can also improve soil quality and store carbon to help adapt to and mitigate climate change by incorporating manure into the soil. Additionally, when crops are rotated with livestock and utilize manure instead of synthetic nitrogen fertilizer (used in conventional crop production), the potential for soil carbon storage dramatically increases. Intensive conventional, non-pasture based dairy production does not sequester carbon because management is not soil based. Instead, manure is stored in lagoons, which are holding ponds containing a mix of manure and water that is used to rinse the manure from structures that house the cows.



SYNTHETIC FERTILIZER AND CLIMATE CHANGE

One of the biggest sources of greenhouse gas emissions in agriculture is the manufacturing and use of synthetic ammonium nitrate fertilizer for conventional farming operations. This is because the industrial factory process used to make that fertilizer—the Haber-Bosch process—is extremely energy intensive, and uses natural gas, coal or oil as a source of hydrogen atoms to combine with unreactive nitrogen. This means that not only are greenhouse gases produced to fuel the process, but also the chemical reaction used to make fertilizer requires direct fossil fuel inputs.

SYNTHETIC FERTILIZER:

-  Belches out around **450 million tons** of CO₂ each year
-  Sucks up over **1%** of the world's total energy production
-  Is responsible for more than any other industrial chemical-making reaction
-  Releases 2.6 metric tons of greenhouse gases per metric ton of fertilizer produced
-  Use has surpassed **200 million tons** globally



→ WHY IT MATTERS:

Antibiotic Resistance

Antibiotics are banned from use in organic dairy production, and with good reason. Using antibiotics can lead to antibiotic-resistant infections in animals that can be passed to humans. Antibiotic resistance has been described as one of the most pressing human health concerns today, and contributes to thousands of deaths each year. While the use of antibiotics in conventional agricultural practices has been implicated as an important contributor to this growing crisis, research also demonstrates that organic farming systems can also be part of the solution because they successfully produce nutritious food without the use of antibiotics.

→ WHY IT MATTERS:

Biodiversity

Reducing the use of synthetic chemicals, especially pesticides, can help support both on- and off-farm biodiversity. Organic farming takes the benefits of pesticide reduction a step further by pairing them with practices that increase agricultural diversity, such as crop rotations, cover crops and the use of hedgerows and windbreaks. Compared to conventional farms, organic farms have greater species richness (the number of species) and overall abundance (number of individuals within a species) of carabid beetles, spiders, earthworms, beneficial parasitoids, vascular plants, birds, bees and other native pollinators, soil microbes and fungi, and small rodents. Organic is also beneficial for species evenness—the relative abundance of species. Oftentimes, conventional agricultural pest management practices can ripple through the food web, affecting a wide range of organisms. As a result, many species will become rare while a small number dominate the landscape, further contributing to pest outbreaks. Organic farming methods assuage this ecological damage while simultaneously providing protection against agricultural pests by promoting evenness among natural enemies and other organisms.

→ WHY IT MATTERS:

Farmworker Health

Farmers and farmworkers are a fundamental part of the United States, producing food for our families and providing an economic scaffolding for our country. Unfortunately, the sustained use of synthetic pesticides in conventional farming systems puts this population at serious risk for a wide range of adverse health effects—a consequence of conventional agriculture that is largely overlooked. Over 1.1 billion pounds of agricultural chemicals are used annually in the United States, and pesticide exposures on conventional farms cause thousands of illnesses every year. A large body of research documents the health risks associated with both short- and long-term exposure to pesticides: cancer, neurodegenerative disorders and poor reproductive health. Even with the best management practices while handling and applying pesticides, farmers and farmworkers are still at risk for exposure. The adoption of organic techniques that avoid the use of toxic, synthetic pesticides provides the surest safeguard against chemical-related occupational health problems.



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