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Is CAFO Animal Waste the Dirty Secret of Organic Foods?

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Chicken feces, or chicken litter, and other animal waste from concentrated animal feeding operations (CAFOs) is commonly used as fertilizer, including for organic crops

CAFO waste used as fertilizer is contaminated with pathogens, including bacteria, fungi, viruses, antibiotics, antibiotic-resistant genes, growth hormones, heavy metals and pesticides

In the U.S., feces from broiler chickens were contaminated with antibiotic-resistant E. coli, with genes resistant to more than seven antibiotics, including amoxicillin, ceftiofur, tetracycline and sulfonamide

A meta-analysis concluded "direct land application of chicken litter could be harming animal, human and environmental health"

The overwhelming presence of CAFOs in the state of North Carolina prompted a civil rights complaint on behalf of residents in three counties

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Farmers have used manure as a natural, nutrient-rich fertilizer for thousands of years. In fact, there's evidence that early farmers used manure to fertilize cereal grains and pulse seeds up to 7,900 years ago. They likely noticed enhanced crop growth in areas where manure naturally accumulated, then tried the method in other areas.[1]

Today, many farmers still depend on manure to help their crops grow. This includes organic farmers[2] and those using permaculture and regenerative methods.[3] When chickens are raised on pasture, their manure is spread across the land and worked into the soil naturally

via pecking and scratching.[4]

This beneficial practice that works in concert with nature bears little resemblance to the use of poultry litter — or chicken feces, sometimes mixed with urine, sawdust, feathers and other materials — and other animal waste from concentrated animal feeding operations (CAFOs) as fertilizer. Yet, this latter practice is common, even among some organic farms.[5]

Chicken Litter Contains Bacteria, Viruses and Other Pathogens

Chicken litter used as an organic fertilizer is considered "the cheapest and most environmentally safe method of disposing of the volume generated from the rapidly expanding poultry industry worldwide."[6]

But a review, published in the International Journal of Environmental Research and Public Health, raises an important point — "little is known about the safety of chicken litter for land application and general release into the environment."[7]

The research team, from Kyambogo and Makerere Universities in Uganda and the University of Florida, set out to remedy this. They conducted a meta-analysis of technical reports, conference proceedings, peer-reviewed journal articles and internet texts, noting that the available data was "scattered and disjointed" making it difficult to access and interpret.

They consolidated the data they did find, however, revealing that "direct land application of chicken litter could be harming animal, human, and environmental health."[8] The review revealed, for instance:[9]

Counts of pathogenic strains of E. coli and coliform bacteria exceeded the maximum permissible limits for land application	**In Australia, broiler litter was contaminated with Actinobacillus bacteria**
Avian influenza, capable of infecting poultry, humans and wild animals, was also detected	**In the U.S., broiler litter was contaminated with antibiotic-resistant E. coli, with genes resistant to more than seven antibiotics, including amoxicillin, ceftiofur, tetracycline and sulfonamide**
Salmonella, E. coli, Actinobacillus, Campylobacter and coliform bacteria were the most prevalent bacterial contaminants	**Pathogenic fungal contaminants were also commonly found in chicken litter, including sources of aflatoxins linked to cancers and liver damage**

Pesticide Residues, Antibiotics, Heavy Metals Also in Manure

The massive quantities of manure flowing from CAFOs amounts to a toxic sludge of contaminants, spread on fields used to grow even organic food.

"The key safety concerns of chicken litter are its contamination with pathogens, including bacteria, fungi, helminthes, parasitic protozoa, and viruses; antibiotics and antibiotic-resistant genes; growth hormones such as egg and meat boosters; heavy metals; and pesticides," the researchers explained.[10]

Chicken litter contains a "vast array" of antibiotics and heavy metals, their meta-analysis showed, including "high concentrations" of cadmium, lead, arsenic and mercury that "pose serious health risks to animals, plants and environmental health."[11]

Pesticides, including dioxins, furans, polychlorinated biphenyls and polycyclic aromatic hydrocarbons, also contaminate chicken litter, as do growth and sex hormones like estrogen and testosterone. Growth hormones have a harmful effect on reproduction in fish and other aquatic organisms, and may persist in the environment for more than two years after they're excreted in chicken litter.

"This persistence increases the potential of the hormones reaching surface water bodies through runoff," according to the team.[12] Further, they noted, "The chlorinated antibiotic and pesticide residues detected in chicken litter are worryingly high. These chemicals are persistent, carcinogenic, and release dioxin when contaminated litter is burnt."[13]

Regarding antibiotics, fluoroquinolones, sulfonamides and tetracyclines were the classes most widely detected. While some antibiotics degrade in soil within about 30 days, others persist and may harm microorganisms and soil fertility. Some antibiotics can also be absorbed into food crops, like green onions, cabbage and corn, from the soil. The analysis noted:[14]

> "The presence of antibiotics, especially those that kill pathogens in chicken litter and are broad spectrum, may distort major biological processes in soil upon application of the litter, including development of antibiotic resistance, which can affect humans, livestock, fish, and wildlife … Human consumption of antibiotics-contaminated foods can increase antibiotic resistance, leading to food poisoning or allergies."

Despite this, they added, "There are no standards set specifically for chicken litter for most of its known contaminants. Even where standards exist for related products such as compost, there is wide variation across countries and bodies mandated to set standards for safe disposal of organic wastes."[15]

Trying to Pass Off a Liability as an Asset

An article posted by Washington State University described using CAFO manure on small farms as a tool to turn a "liability to an asset."[16] But even putting the contamination issues aside, the amount of waste generated by CAFOs is massive. In the U.S., 1.37 billion tons of solid animal waste are produced every year. That's 130 times more than the amount of human waste generated annually.[17]

Often, the waste is held in "lagoons" that are meant to be impenetrable. But even under the best circumstances, the lagoons may leak, seeping millions of gallons of waste a year into

neighboring soil and groundwater.[18] Waste may also be sprayed onto nearby "sprayfields," creating more environmental destruction. Natural Resources Defense Council explained:[19]

> "People living near factory farms are placed at risk. Hundreds of gases are emitted by lagoons and the irrigation pivots associated with sprayfields, including ammonia (a toxic form of nitrogen), hydrogen sulfide, and methane. The accumulation of gases formed in the process of breaking down animal waste is toxic, oxygen consuming, and potentially explosive, and farm workers' exposure to lagoon gases has even caused deaths.
>
> People living close to hog operations have reported headaches, runny noses, sore throats, excessive coughing, respiratory problems, nausea, diarrhea, dizziness, burning eyes, depression, and fatigue. The pathogenic microbes in animal waste can also infect people.
>
> Water contaminated by animal manure contributes to human diseases such as acute gastroenteritis, fever, kidney failure, and even death. Nitrates seeping from lagoons and sprayfields have contaminated groundwater used for human drinking water."

In cases of natural disasters, such as Hurricane Florence, which hit the Carolinas in September 2018, even more devastation can result. During that tragic event alone, at least 132 CAFO lagoons released pig waste into the environment.[20]

The National Pork Council tried to downplay the damage, stating that solids are stored mostly at the bottom of lagoons while the liquids at the top are heavily diluted and therefore would minimize the environmental impact if they were to spill over.[21]

Yet, as noted by Sacoby Wilson, a professor of public health at the University of Maryland, to Vice News, "You basically have a toxic soup for people who live in close proximity to those lagoons … All of these contaminants that are in the hog lagoons, like salmonella, giardia, and E. coli, can get into the waterways and infect people trying to get out."[22]

So, CAFO waste is nearly always a liability — one that shouldn't be framed as an "asset" for neighboring small farms. In response to the Washington State University article, commenter Michaelyn Erickson said:[23]

> "Hey CAFO, is that lipstick on your confined pig? As a Permaculturist and small farmer, this doesn't sound like a solution at all. It sounds like an attempt by big agriculture to dump its waste off on unsuspecting small farms like me. I don't want your hormone-filled tortured cow excrement … that is your responsibility to deal with not mine."

CAFOs Violating Residents' Civil Rights

The overwhelming presence of CAFOs in the state of North Carolina prompted a civil rights complaint from lawyers with the Environmental Justice Clinic at Vermont Law and Graduate School. The complaint was filed with the U.S. Environmental Protection Agency (EPA) for residents in three North Carolina counties.[24]

The residents described piles of chicken litter that are more than 8 feet tall, waiting to be spread on nearby fields. "They stand there and start fuming off. The odor is terrible,"

resident Henry Brewer stated in the complaint. “Sometimes it feels like the flies are about to eat us alive — the dogs can’t even live in the yard.”[25]

Due to a loophole in state environmental regulations, chicken CAFOs have been set up without any permitting requirements in North Carolina, and they’re decimating low-income counties at a disproportionate rate. Civil Eats reported:[26]

> “‘Under state law, DEQ [Department of Environmental Quality] has to take into account cumulative impacts that are happening in a particular location,’ said Fredrick Ole Ikayo, a legal fellow who worked on the complaint. ‘But they don’t even know where these poultry facilities are or anything about the way they are polluting the air and water.’”

In addition to violating residents’ civil rights, manure from industrial agriculture is a primary source of nitrogen and phosphorus in surface waterways and groundwater, according to the EPA.[27] The resulting damage includes an excess of nutrients that lead to algae overgrowth, depleting the water of oxygen and killing fish and other marine life in expansive dead zones.

This, combined with the excess fertilizers applied to monocrops like corn and soy, sends a steady stream of nitrogen and phosphorus to both surface and groundwater, spreading potentially disease-causing organisms and unsustainable amounts of nutrients along the way.

Was Your Food Grown in Sewage Sludge?

Sewage sludge, a waste product that comes from wastewater treatment facilities, is also widely applied to agricultural fields as a fertilizer. Often used interchangeably with the term biosolids, the compound is just as unappealing as it sounds.

When wastewater and storm water enter wastewater treatment facilities, the solid and liquid waste are separated. The solids are “digested” using bacteria, treated, dried and then sent to landfills or used for agricultural purposes as “fertilizer.” In the U.S., 54% of sewage sludge biosolids are used for so-called “beneficial” purposes.

Most often this means they’re applied to agricultural sites, although small amounts are also applied to forestry sites, reclamation sites, including Superfund and Brownfield lands and urban areas, including park land. Broken down, it’s estimated that 36% of biosolids are used for agricultural purposes while 28% end up in landfills and 15% are incinerated.[28]

The fact is, just like animals, humans produce a healthy amount of waste. How to dispose of this biosolid sludge is a vexing problem worldwide, so, theoretically, turning the waste product into a beneficial product like fertilizer makes sense, assuming it could be thoroughly purified.

Therein lies the problem, however. The Guardian quoted former EPA scientist David Lewis, who opposed the use of sewage sludge on cropland. Lewis noted, “Spending billions of dollars to remove hazardous chemicals and biological wastes from water, only to spread them on soil everywhere we live, work and play defies common sense.”[29]

As of December 21, 2022, the EPA detected 739 chemicals in sewage sludge used in the

U.S. as a soil amendment.[30] Fortunately, unlike CAFO waste, sewage sludge is prohibited in organic farming.[31]

How to Find Toxin-Free Food

Foods grown on soil treated with CAFO waste or biosolids are not labeled as such, so your best bet for avoiding them is to support sustainable agriculture movements in your area. Make it a point to only buy food from a source you know and trust, one using safe, nontoxic growing methods.

Remember, small regenerative farmers commonly use rotational grazing of multiple species to mimic natural cycles. This keeps pastures — and the animals that live on them — healthy.

This method also depends on animal manure to fertilize the soil, but the manure is not contaminated like CAFO waste — and it exists on a manageable scale that supports the farm's overall health instead of harming it. This is not the same as the industrially sourced CAFO waste that's sprayed over farm fields.

Growing your own food is another way to ensure what you're eating isn't exposed to CAFO waste. But be careful when purchasing potting soil and compost, as companies do not have to disclose when biosolids are used. If you see "Milorganite" on the label, however, it contains biosolids from the city of Milwaukee Metropolitan Sewerage District — a national distributor.[32]

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