Feeding the World Better *Without* Factory Farms

A Citizen Guide to Achieving a Sustainable, Equitable & Humane Food System That is Good for the Planet, People, and Animals.

Hoosier Environmental COUNCIL

All. Together. Now.

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All. Together. Now.

We've all heard the myth -- factory farms are inevitable and necessary to "feed the world." This myth is perpetuated by the meat industry to maintain public support for its system of industrial animal agriculture that is a leading cause of the most serious environmental problems we face, at every scale from local to global, including climate change. While we will have to feed a growing global population that is expected to reach 9.7 billion by 2050, raising factory-farmed animals pumped with growth hormones and antibiotics in inhumane, confined conditions is not the answer.

The truth is that the world already produces enough food to feed up to 16 billion people. The real problem we face is that much of that food goes to feed livestock instead of people. Indeed, a staggering amount of land, water, and energy resources go to growing vast monocrops of corn and soy to feed industrially reared farm animals, not to grow crops for direct human consumption. This hugely inefficient system of feeding billions of animals to "feed the world" overexploits the available natural resources of our planet, is a leading cause of species extinction and biodiversity loss, air and water pollution, is a major contributor of greenhouse gases, and serves only the bottom line of huge multinational corporations that seek to dominate and control global food production, at the expense of small, independent farmers who can't compete. We can and must transform this destructive, industrial model to a diverse, sustainable one that feeds the world with better quality food and without ravaging the planet.

To that end, the goal of HEC's Sustainable Food & Farming project is twofold. The first aim is to raise awareness of problem and dispel the meat industry's myth that factory farms are necessary. The second goal is to grow the movement of informed and engaged citizens demanding change. This Citizen Guide was developed as part of this project to arm Hoosiers with the information they need to be effective advocates for laws that: (1) require meat companies to internalize the true costs of meat production, including to the environment and human health; (2) restore property rights of rural citizens; and (3) provide a level playing-field for small farmers by breaking up agribusiness monopolies and ending tax and other incentives for growing monocrops to feed livestock. In addition to providing the most up-to-date information about the known, adverse effects of factory farming, this Guide details the current gaps in federal and state laws that allow irresponsible siting of factory farms, fail to limit their noxious and dangerous air pollution, strip impacted citizens of their property rights, and shield factory farms with special legal immunity from liability for the harm they cause. This Guide concludes with specific actions that citizens can take to effectively advocate for necessary policy reform and make informed food choices to increase consumer demand for more healthy, sustainably sourced food.

We hope you find the information helpful.

--The HEC Team

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WHAT IS A FACTORY FARM?

Factory farms are nothing like traditional livestock farms, which are typically small, family-owned operations that raise animals in open pasture, fed with crops grown onsite, and sold at local livestock markets.[1] Conversely, a factory farm is a highly mechanized operation that relies on technology, antibiotics, and imported feed to raise thousands of animals in large confinement facilities with the purpose of maximizing profit, speed, production, and market share for corporate conglomerates.[2] Depending on their size, factory farms are also referred to as animal feeding operations (AFOs), confined feeding operations (CFOs), or concentrated animal feeding operations (CAFOs) for regulatory purposes. These terms are defined as follows:

Animal Feeding Operation (AFO)

Under federal and state law, **an AFO** is a facility that raises animals in confinement for 45 days or more during a 12-month period and does not grow crops or other vegetation during the normal growing season on more than 50% of the facility. The 45 days of animal confinement do not have to be consecutive, and the 12-month period need not correspond to the calendar year.[3] In addition, the existence of crop growth is evaluated during the season when the animals are confined. For example, a winter feedlot that grows crops only during the summer months when animals aren't confined, would still be considered an AFO because crops are not present when animals are in confinement. The number of animals is irrelevant to the question of whether a facility is an AFO and, **with few exceptions, AFOs are not subject to regulatory requirements.**

Confined Feeding Operation (CFO)

In Indiana, **a CFO is as an AFO** that confines at least 300 cattle, 600 swine or sheep, 30,000 poultry, or 500 horses. **An AFO that is found to be violating water pollution control laws may be regulated as a CFO**.[4] But since AFOs are not subject to permitting oversight, whether they are violating the law is really anyone's guess.

Concentrated Animal Feeding Operation (CAFO)

CAFOs are CFOs that confine a greater number of animals including at least: 700 mature dairy cows; 1,000 veal calves; 1,000 cattle other than mature dairy cows or veal calves; 2,500 swine when each weigh 55 pounds or more; 10,000 swine when each weigh less than 55 pounds; 500 horses; 10,000 sheep / lambs; 55,000 turkeys; 30,000 laying hens or broilers if the AFO uses a liquid manure handling system;[5] 125,000 chickens (other than laying hens), if the AFO uses something besides a liquid manure handling system; 82,000 laying hens if the AFO uses something besides a liquid manure handling system; 5,000 ducks if the AFO uses a liquid manure handling system; or 30,000 ducks if

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[1] William McBride & Nigel Key, Econ. Res. Serv., USDA, ERR-158, *U.S. Hog Production from 1992 to 2009: Technology, Restructuring, & Productivity Growth* 5 (2013).

[2] *Id.* at 5, 17-21.

[3] 327 IAC 19-2-3.

[4] 327 IAC 19-2-7.

[5] A liquid manure handling system used for laying hens typically involves a slotted barn floor and a gutter or a concrete storage pit below. Manure falls through the slotted floor into the gutter or pit and is then periodically pumped from these pits / gutters into to a larger outside storage "lagoon."

the AFO uses something besides a liquid manure handling system.[6] With few exceptions, **CAFOs are subject only to Indiana regulations**, even though the federal Clean Water Act identifies them as point sources of water pollution.

For purposes of this citizen guide the term **"factory farm" is used to describe AFOs, CFOs, and CAFOs.**

Table 1: Minimum Number of Confined Animals for Regulation as a CFO or CAFO

Livestock	CFO	CAFO
Mature dairy cows	300—699	700+
Calves	300—999	1,000+
All other cattle (heifers, steers)	300—999	1,000+
Swine (55 pounds or more)	600—2,499	2,500+
Swine (less than 55 pounds)	600—9,999	10,000+
Laying hens or broilers[7] with liquid manure system	30,000	30,000+
Laying hens without liquid manure system	30,000—81,999	82,000+
All other chickens without liquid manure system	30,000—124,999	125,000+

Indiana's Factory Farms

Indiana's livestock inventory includes approximately 844,000 cows and calves, more than 4 million hogs and pigs, and roughly 40 million poultry birds.[8] Most of these animals are warehoused at Indiana's 1,800 or so factory farms.[9] Indeed, Indiana ranks 2nd nationally for egg production with 26.4 million laying hens, 90% of which (24 million) are confined in just 25 factory farms. Indiana also leads the country in hog production, ranking sixth nationally with 11.3 million hogs sold annually, 91% of which (10.3 million) come from just 516 hog factories.[10] As indicated in the map below,[11] most of Indiana's factory farms are concentrated in the north-central region of the state with the highest concentrations in Carroll, Davies, Decatur, Dubois, Jay, Kosciusko, Wabash, and White counties.

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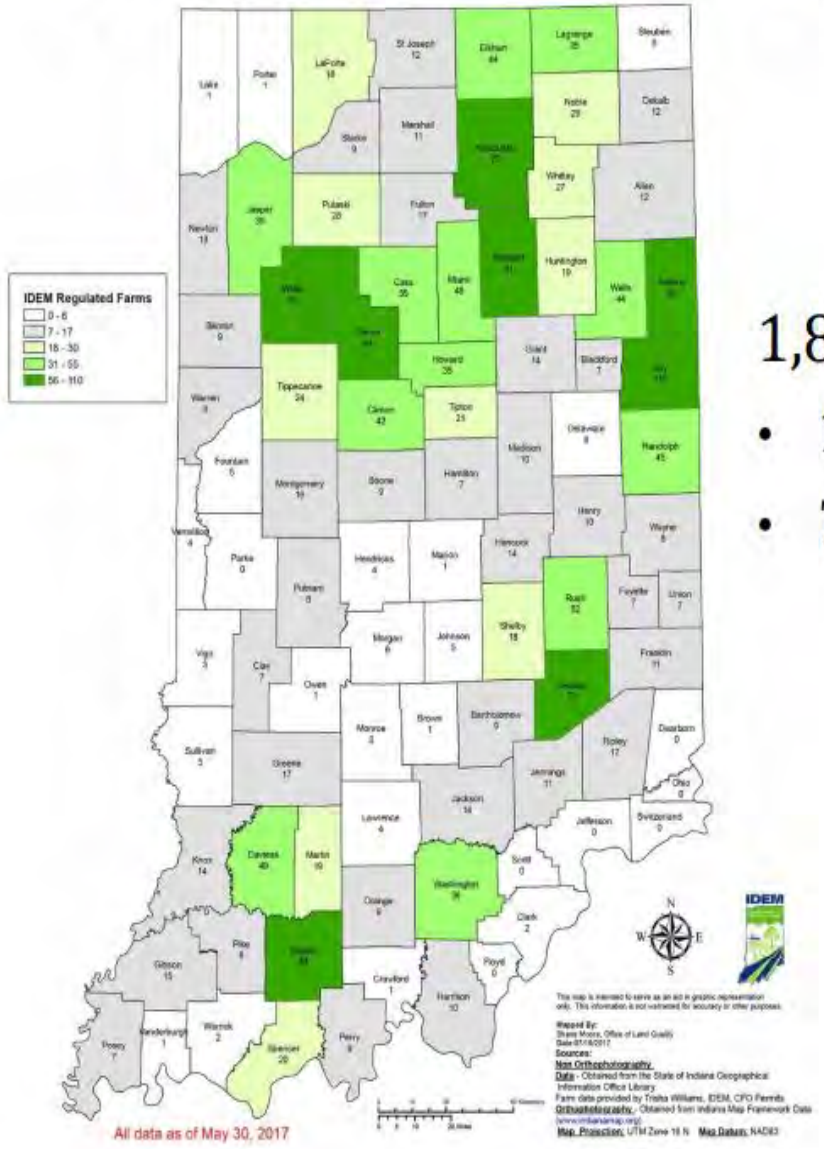
[6] 40 CFO 122.23.
[7] Chickens farmed for eggs are called laying hens or layers. Chickens farmed for meat are known as broilers.
[8] USDA, 2017 Census of Agriculture- Indiana State Data.
[9] Indiana Department of Environmental Management, *2020 Annual Reports to the General Assembly* at 5 (reporting CFO/CAFO numbers as of June 30, 2020).
[10] USDA, 2017 Census of Agriculture- Indiana State Data.
[11] More recent numbers are available at IndianaMap Open Data Hub, which provides a searchable database of Indiana's permitted Confined Feeding Operations at https://gis-

IDEM Regulated Farms Per County



1,815 Total Farms:

- 1,019 CFO Sized Farms
- 796 CAFO Sized Farms

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INDUSTRY CONSOLIDATION AND THE RISE OF FACTORY FARMS

There are now roughly 25,000 factory farms in the U.S. that produce the majority (7.1 billion) of the 9.8 billion farm animals slaughtered each year for food. While the country has lost nearly 300,000 of its small-scale family farms since 1997, we are producing nearly 2 billion more farm animals annually due to the expansion of factory farms and corporate consolidation of the meat industry. And this trend is continuing at an alarming rate. Data from the most recent Agricultural Census shows that today there are 190 million more animals confined on factory farms than there was in 2012—a 14% increase in less than a decade. For instance, nearly 94% of all hogs sold in the U.S. are now produced on operations with more than 5,000 hogs, up from 87% in 2007, and 65% in 1997.[12] Indiana is no exception. Indeed, approximately 91% of all hogs sold in Indiana are now produced on factory farms with over 5,000 hogs, up from 79% in 2007, and 45% in 1997. **This did not happen overnight.**

50 Years of Farm Policy

Farming is a unique business. The volatility of weather, pests, global markets and more make it unpredictable in ways that are unrelated to the farmers' skill or management. Most farmers have to borrow a great deal of money every year for operating costs, new equipment, and repairs with the anticipation that their harvest will earn enough to pay back the loans. But because harvest comes at roughly the same time every year for everyone, the price farmers get for their goods drops at the peak of harvest when the market is suddenly flooded. Thus, ironically, the better the harvest, the lower the price a farmer will likely get. Farming is also unique because it is critical to the nation's security -- people must eat. Thus, the government has long propped up farmers with safety nets and other policy incentives.

Following the Great Depression in the 1930s, the New Deal included substantial changes in farm policy to guarantee farmers a fair price for their goods, even during bad years. A key feature was a supply management program that: set a floor price -- essentially a minimum wage -- to ensure farmers' prices would not drop too far below the cost of production; created a grain reserve, which allowed the government to purchase surplus commodities to keep them off the market; and created conservation incentives to keep marginal land out of production.[13]

In the mid-1950s, corporate interest groups proposed to "modernize" farming to address what they saw as economic inefficiencies that were contrary to their financial interests; that is, too many farmers on diversified farms and a short supply of factoryworkers. These corporate groups proposed plans to eliminate a third of farm families by replacing a network of millions of medium-sized family farms with fewer, much larger farms producing the same quantities more "efficiently," while the displaced farmers went to work in factories.[14] Federal farm policy followed with weakening of the supply management program and instructions to farmers to "get big or get out."

Thereafter, the goal of agricultural policy shifted from support of farmers to the support of commodity prices for agribusiness. The "minimum wage" floor price for farmers was eliminated and replaced with a system of direct subsidies that supported low prices for corporate purchasers. This served to expand corporate consolidation and control and resulted in farmers "getting out" in droves. The number of farms dramatically dropped from 7 million in 1935 to just under 2 million in 1997.[15] As farmers continued to go out of business because they couldn't survive without a price floor, the USDA devised a stopgap measure of subsidies and crop insurance to ensure continued production of cheap grain that the meat and processed food industries had come to rely on.

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[12] USDA, Census of Agriculture data from 1997 to the present.

[13] Schaffer, Harwood D., *An Analysis of a Market-Driven Inventory System (MDIS),* Agricultural Policy Analysis Center, Department of Agricultural and Resource Economics, University of Tennessee Institute of Agriculture (2012).

[14] Committee for Economic Development (CED), *An Adaptive Program for Agriculture* (1962) reprinted in *Beyond the Crisis: Solutions for Rural America,* League of Rural Voters' Booklet (1979).

[15] Hossein Ayazi and Elsadig Elsheikh, *The U.S. Farm Bill, Corporate Power and Structural Racialization in the United States Food System,* Berkley University, Haas Institute (2018).

At the same time as farms were consolidating and expanding, farming methods were industrialized, mechanized, and specialized with an ever-increasing reliance on fossil fuels. Tractors and other equipment got bigger; chemical fertilizers dramatically increased crop yields; improved irrigation technologies forced otherwise dry areas into production; and animals were moved into large confinement operations.[16]

Antitrust Concerns

Corporate consolidation and control are now central features of the U.S. and global food system, especially in the meat industry. Today, just four companies control 73 percent of beef processing, 67 percent of pork processing, 54 percent of chicken processing, and 45 percent of the retail grocery market.[17] This concentration – which does not account for rising consolidation or vertical integration – has profound implications for everyone connected to the food system, from farmer to consumers.[18] Indeed, economists agree that an industry is no longer competitive when the market share of the top four companies is 40 percent or higher, which leads to an exclusion of competitors, reduced wages for workers, high prices for consumers, a decline in product quality, and depressed innovation and research.[19]

Unfortunately, this corporate consolidation has created a food system that is neither sustainable nor resilient as the COVID-19 pandemic revealed. As millions of people stopped going to work and to school and ate more meals at home instead of going out to restaurants, the food industry found that it could not easily pivot from supplying institutional customers to people at home. This was especially so in the meat supply chain, where COVID outbreaks at several industrial meat processing plants severely diminished the ability of CAFO operators to get animals processed. In turn, local butchers that serve small farmers, faced a sudden surge in demand, but did not have the resources to rapidly expand their operations. This all meant that industrial producers and small farmers alike were forced to euthanize livestock, despite the demand for beef and chicken.[20]

While food was being purposely destroyed during the pandemic, tens of millions of Americans -- including farmers and food industry workers -- struggled to feed their families and lined up at food banks. This stark juxtaposition revealed that our current food system is inherently fragile and vulnerable to disruption.[21] It also revealed that the system was never designed to benefit farmers or consumers in the first place. Indeed, food insecurity, malnutrition, and diet-related health issues already affected millions of Americans *pre*-pandemic.[22] Not only that but today's farmers receive less than 15 cents for every dollar that consumers spend on food.[23] Rather, the current food system was designed to maximize the efficiency and profits of multinational food corporations, which accrue more than 80 cents of every food dollar spent and have remarkably emerged from the pandemic insulated and profitable, despite the economic devastation suffered by restaurants and food workers.[24]

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[16] For more about this history, read *"Foodopoly"* by Wenonah Hauter available at https://www.foodopoly.org/.
[17] Lakhani, Uteuova, et. al., *Revealed: The True Extent of America's Food Monopolies, and Who Pays the Price,* The Guardian (Jul. 14, 2021) at https://www.theguardian.com/environment/ng-interactive/2021/jul/14/food-monopoly-meals-profits-data-investigation.
[18] *Id.;* Hendrickson, Howard, et. al., *A Special Report to the Family Farm Action Alliance,* University of Missouri, Michigan State University (Nov. 2020).
[19] Ethan, Gurwitz, et. al., *Reviving Antitrust: Why Our Economy Needs a Progressive Competition Policy,* Center for American Progress (June 2016).
[20] *See* Tom Colicchio and Pierre Ferrari, *We Can End Hunger in America--If We're Willing to Make Significant Changes to Our Food System,* TIME (Jan. 2021); *see also* National Sustainable Agriculture Coalition, *The Time is Ripe for Competition and Antitrust Reform in Agriculture* (Feb. 2021).
[21] John Ikerd, *Crisis and Opportunity for Local Food Systems* (July 17, 2020) at johnikerd.com.
[22] FoodPrint, *Sustainable Agriculture vs. Industrial Agriculture,* Grace Communications Foundation at https://foodprint.org.
[23] Lakhani, et. al. *Revealed: The True Extent of America's Food Monopolies, and Who Pays the Price,* The Guardian (Jul. 14, 2021).
[24] MacMillan, Whoriskey, et. al., *America's Biggest Companies are Flourishing During the Pandemic and Putting Thousands of People Out of Work,* The Washington Post (Dec. 16, 2021).

Threats to Water Quality

Based on government data, we know that the leading source of water contamination in Indiana is *E. coli*, which indicates that animal waste is present in our water bodies.[25] The presence of *E. coli* is due, in part, to releases of human waste from combined sewer overflows (CSOs), sanitary sewer overflows (SSOs) and failed septic systems, but most of the contamination is from the state's factory farms.[26] This makes sense given that Indiana's livestock generate as much untreated urine and feces as that produced by 87 million people or 14 times the human population of Indiana.

It is well known that animal waste contains high levels of phosphorus and nitrogen as well as pathogens like *E. coli* and parasites, which is why human waste is treated. However, under current regulation, livestock waste does not have to be treated, is minimally controlled, and rarely monitored causing it to contaminate the water bodies it enters, which can happen in a variety of ways. When too much animal waste is applied to land, it can wash away with rain or melting snow and run off into a nearby waterway. Also, the massive amount of waste generated at a factory farm is typically stored in massive pits or "lagoons." When these structures leak, leach or overflow, the untreated animal waste can wash into nearby waterways or leach directly into the ground water.[27] This is especially dangerous given that many rural Hoosiers rely on groundwater in untreated private wells for their primary source of drinking water. In addition, some drinking water utilities rely on surface water intakes or reservoirs to supply urban and suburban drinking water, so the risk is not limited to rural residents.

And this risk of contamination is not theoretical either. In 2009 a massive spill of 4.5 million gallons of untreated animal waste from a large hog CAFO contaminated the Mississinewa River and resulted in widespread fish kills and hundreds of thousands of dollars in clean up fees.[28] Another example, in 2010, a hog producer in Randolph County land applied more than 232,000 gallons of untreated animal waste to a farm field adjacent to Beaver Creek. The field was never planted and after heavy rains, the manure was swept into Beaver Creek and finally to the Mississinewa River. This spill resulted in another fish kill of over 100,000 fish.[29] In June of 2016, 30,000 gallons of dairy waste was dumped into the Little Flatrock River killing fish for 10 miles from Milroy to Greensburg forcing the Greensburg drinking water utility to close their surface water intake.[30] And more recently in October of 2018, more than 3,100 fish were killed in the Salamonie River due to land application of hog waste on a field in Portland, Indiana.[31]

The effects of water contamination from animal waste are serious. When phosphorus in manure enters a water body in high-enough concentrations, it is known to cause eutrophication and toxic blue-green algae blooms, which kill fish and other aquatic life, and can be harmful to human health. In fact, the Indiana State Department of Health (ISDH)

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[25] IDEM, 2020 Indiana Integrated Water Monitoring and Assessment Report, Appendix A, Table 10 (indicating that *E.coli* continues to be the top cause of stream impairments in Indiana, effecting the recreational use of 24,001 miles of streams).
[26] *Id.* at Table 11.
[27] *See e.g.,* Paul Ebner, *CAFOs and Public Health: Pathogens and Manure,* Purdue University Extension ID-356.
[28] Seth Slabaugh, *Millions of Gallons of Hog Manure Spilled: State Officials Believe the Discharge Might Have Been Deliberate*, Muncie Star Press (May 12, 2009).
[29] Seth Slabaugh, *200,000 Gallons of Manure Sprayed Before Randolph County Fish Kill*, Muncie Star-Press (September 13, 2010)
[30] Greensburg Daily News, *IDEM: Fish Kill in Little Flatrock River Caused by Manure* (June 28, 2016).
[31] Associated Press, *Indiana Cites 3 Hog Farms for Spills, Runoff, 2 Fish Kills* (Mar. 15, 2019).

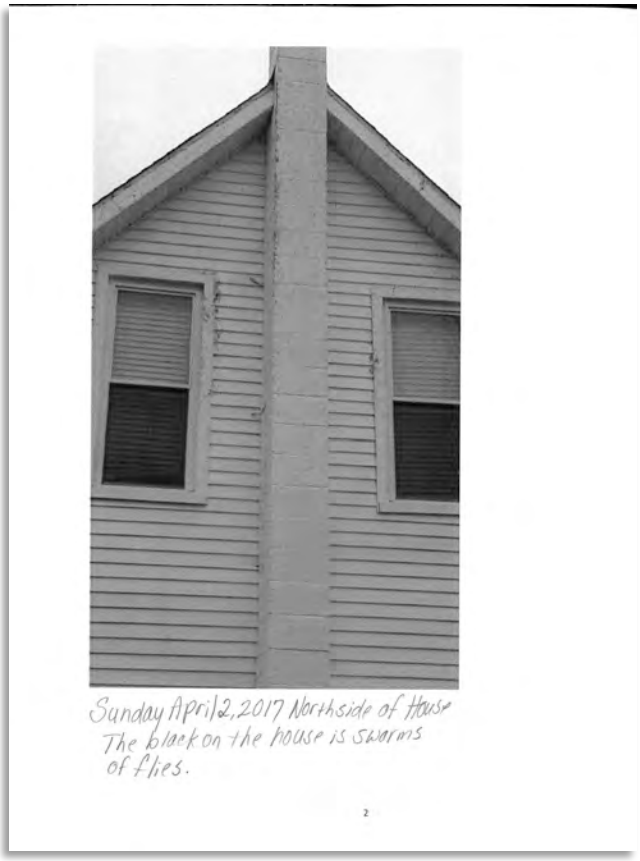
closes numerous beaches each summer due to high concentrations of blue-green algae, and generally cautions Hoosiers recreating on any of Indiana's lakes or reservoirs to avoid contact with visible algae or swallowing water while swimming.[32] This is because exposure to blue-green algae can lead to rashes, skin and eye irritation, nausea, stomachaches, and numbness in fingers and toes, and can also be very dangerous for pets.

Other health risks associated with animal waste-contaminated waters are equally serious. The numerous pathogens and parasites, such as fecal coliform (*E.coli*) and other forms of coliform bacteria found in manure are easily communicable to human populations. When these pathogens contaminate drinking water they can cause gastrointestinal illnesses, kidney damage or failure, and in extreme cases, death.[33] Currently, 98% of impairments to Indiana's assessed stream miles is due to unsafe concentrations of pathogens.[34] Some of those impaired streams are in Delaware County including segments of Mud Creek, Campbell Creek, Bosman Ditch, Rees Ditch, Studebaker Ditch, Packard Run, Hayden Ditch, Love Ditch, Holdren Ditch, Dodge Creek, No Name Creek, Bell Creek, Williams Creek, Buck Creek, York Prairie Creek, Gibson Ditch, Small Branch, and several segments of the Mississinewa River.[35]

Quality of Life Concerns

We often hear from Hoosiers who live near factory farms that their traditional, rural way of life has been dramatically disrupted by the stench of thousands of animals. Some families who rely on well water for drinking water report that it smells like manure and is undrinkable. Several have reported that nearby streams often have a "murky" or "frothy" look and smell like animal waste. Some residents report that their homes are infested with flies and permeated by the horrific smell of rotting, dead animals. And, since factory farms render nearby homes substantially less valuable, families are effectively forced to live with these unbearable conditions.

An unfortunate example is the plight of Nancy Banta who lives in Hawcreek Township where most of Bartholomew County's CAFOs are located. One is a CAFO with 4,400 hogs that was built in 2014 within a half mile and upwind of Nancy's home. Since then she reports experiencing "instant headache, closure of the sinuses, taking away of the breath," on exposure to the CAFO's noxious emissions and smells.[36] Nancy also shared with us that her doctor visits have doubled since the CAFO became operational due to respiratory illness. And, as this photo of her home shows, it is now infested with flies.



[32] *See* ISDH's webpage on Blue-Green Algae at http://www.in.gov/boah/2617.htm; *See also* IDEM's webpage on Blue-Green Algae for the latest sampling and listing of recreational advisories and beach closures at https://www.in.gov/idem/algae/2310.htm.
[33] *See e.g.,* Bukholder, Libra, et. al., *Impacts of Waste from Concentrated Animal Feeding Operations on Water Quality,* Environ. Health Perspect. 115(2): 308-312 (Feb. 2007).
[34] IDEM, 2020 Indiana Integrated Water Monitoring and Assessment Report, Appendix A, Tables 9 and 10.
[35] IDEM 303(d) Impaired Waters List (2020) available at https://www.in.gov/idem/nps/2639.htm.
[36] Mark Webber, *Hartsville hog farmer gets state approval to house 8,800 pigs,* The Republic (Apr. 12, 2017) (quoting Nancy Banta and describing the permitting and zoning history of the nearby Gelfius CAFO).

Air Quality and Human Health

The health threats from factory farms are largely due to the tremendous amount of "manure" they generate which, by regulatory definition can include: not only "liquid or solid animal excreta" but also livestock production wastes such as "excess drinking water, clean up water, contaminated livestock truck or trailer wash-water, milking parlor wastewater, egg wash-water, and silage leachate," among other constituents.[37] Because these wastes are collected and stored in massive pits and lagoons that lack oxygen (known as anaerobic lagoons), the waste decomposes and putrefies quickly releasing dangerous gases including hydrogen sulfide, ammonia, particulate matter, endotoxin[38] and other harmful emissions.[39]

For example, a Purdue University study of air emissions at a dairy CAFO in Indiana found ammonia released at a rate of between 18 and 75 grams per day per cow.[40] In other words, a CAFO with 1,400 cows will emit as much as 200 pounds of ammonia into the air every day. And, these gases are disbursed into the surrounding area where people live in a number of ways: (1) factory farms with waste pits underneath the confinement buildings typically have large ventilation fans that pull the gases out of the buildings and blow them into the outside air to protect the animals; (2) factory farms with open air "lagoons" allow perpetual off-gassing to occur; (3) when the collected waste is sprayed onto fields, emissions are directly released; and (4) confinement barns that are open-sided allow gases to escape.

The resulting stench can be unbearable, but even more concerning are the serious health effects. For instance, one of the most dangerous gasses, hydrogen sulfide, is harmful even at low levels. It is a potent neurotoxin that can cause damage to the brain and nervous system. People exposed to concentrations of even 0.1-1 parts per million (ppm) display neurobehavioral dysfunction, including abnormal balance and delays in verbal recall. Its effects are irreversible and can also include skin rashes, seizures, comas, and even death.[41] Like hydrogen sulfide, ammonia is a noxious gas that poses serious health risks. Ammonia has an acrid, repellant odor at levels above 0.7 ppm. It causes eye irritation beginning at 4 ppm and irritation of the nose and throat above 25 ppm. Ammonia can also trigger asthma attacks in some asthmatics,[42] which is particularly concerning for children. A recent study confirmed that children with asthma had decreased measured lung function with increasing ammonia levels in the air.[43] Consistent with that finding, an

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[37] *See* Indiana's CFO rule definition of "manure" at 327 IAC 19-2-25.

[38] Endotoxin is a component of Gram-negative bacteria that can stimulate inflammatory responses. When it is inhaled, it causes throat irritation and narrowing of the airways. *See* Heederik, D., et. al., *Health effects of airborne exposures from concentrated animal feeding operations,* Environ. Health Perspect. 115:298-302 (2007); *see also* S. Gibbs, et. al., *Isolation of Antibiotic-Resistant Bacteria From the Air Plume Downwind of a Swine Confined or Concentrated Animal Feeding Operation,* Environ. Health Perspect. 114:1032-1037 (2006).

[39] Claudia Copeland, *Air Quality Issues and Animal Agriculture: A Primer,* U.S. Congressional Research Service, RL32948 (Dec. 22, 2014); C. Hribar, *Understanding Concentrated Animal Feeding Operations and Their Impact on Communities* (2010); Iowa State University and University of Iowa College Study Group, *Concentrated Animal Feeding Operations Air Quality Study* (2002).

[40] Purdue University, *National Air Emissions Monitoring Study: Emissions Data From Two Free Stall Barns and a Milking Center at a Diary Farm in Indiana-Site IN5B,* Final Report (2010).

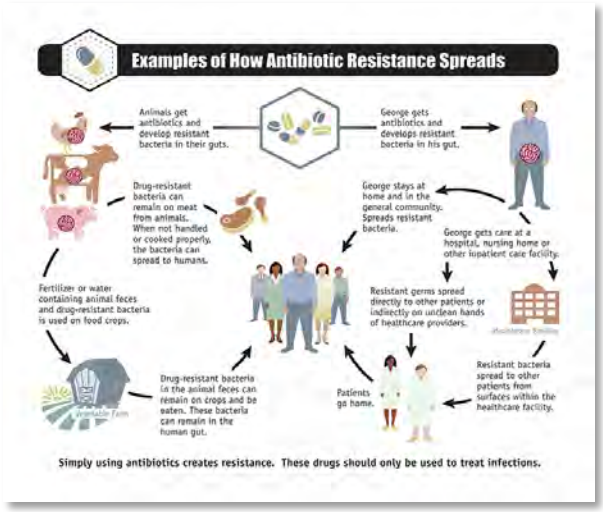
[41] Agency for Toxic Substance and Disease Registry, *ToxFaqs: Hydrogen Sulfide* (2014); National Ag Safety Database, *Manure Gas Dangers Fact Sheet* (2002); KH Kilburn, *Evaluating Health Effects from Exposures to Hydrogen Sulfide: Central Nervous System Dysfunction,* Environmental Epidemiology and Toxicology (1999).

[42] Agency for Toxic Substance and Disease Registry, *ToxFaqs: Ammonia,* (2014).

[43] C. Loftus, et.al., *Ambient Ammonia Exposures in an Agricultural Community and Pediatric Asthma Morbidity,* Epidemiology 26:794-801 (2015).

earlier 2006 study found that children who attended a school located 1/2 mile from a CAFO showed a prevalence of physician-diagnosed asthma in 19.7% of cases whereas only 7.3% of children exhibited asthma symptoms from the control school more than 10 miles away.[44]

Other adverse health effects from factory farm emissions are well documented. In addition to nausea, headache and vomiting, more than 30% of CAFO workers report serious respiratory problems.[45] One study found that Iowans living within two-miles of a 4,000-hog CAFO had more respiratory and other symptoms than a control group not living near a CAFO.[46] Another study showed that people living near hog CAFOs reported more confusion, tension, depression, and fatigue than did those not living nearby.[47] Due to these health threats, **the American Public Health Association enacted a new policy statement calling for a moratorium on all new and expanding CAFOs until these public health concerns are addressed.[48]**



Antibiotic Resistant Disease

The FDA confirmed that roughly 80% of antibiotics in the U.S. are used in livestock.[49] These drugs are fed to non-diseased animals to promote growth and ward off disease from living in unnatural, confined conditions.[50] This has contributed to antibiotic-resistant disease in humans,[51] such as MRSA, a pathogen responsible for taking more lives each year than AIDS.[52] Antibiotic resistant infections also require multiple rounds of increasingly stronger antibiotics, which allow the infection to progress further than it might otherwise, leading to serious health consequences. While the livestock industry asserts there is not enough evidence to ban prophylactic use of antibiotics in livestock, the CDC definitively confirms that:

> *Scientists around the world have provided strong evidence that antibiotic use in food animals can lead to resistant infections in humans. Studies have shown that: antibiotic use in food animals allows antibiotic-resistant bacteria to grow and crowd out the bacteria that do respond to antibiotics; resistant bacteria can contaminate food from the animals; and resistant bacteria in food can cause infections in humans.*"[53]

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[44] J. Kline and S. Sigurdarson, *School Proximity to Concentrated Animal Feeding Operations and Prevalence of Asthma in Students,* Chest (2006).

[45] KJ Donham, *The Concentration of Swine Production: Effects on Swine Health, Productivity, Human Health and the Environment,* Veterinary Clinics of North America: Food Animal Practice (2000).

[46] KM Thu, et al., *A Control Study of the Physical and Mental Health of Residents Living Near a Large-Scale Swine Operation,* Journal of Agricultural Safety and Health (1997).

[47] S. Wing and S. Wolf, *Intensive Livestock Operations, Health and Quality of Life Among East North Carolina Residents,* Environmental Health Perspectives (2000).

[48] John Hopkins Center for a Livable Future, *Nation's Leading Public Health Organization Urges Halt to All New and Expanding CAFOs* (Nov. 18, 2019).

[49] FDA, *Antimicrobials Sold or Distributed for Use in Food Producing Animals* (Sept. 2014).

[50] M. Mellon, et. al., *Hogging It: Estimates of Antimicrobial Abuse in Livestock,* Union of Concerned Scientists (2001).

[51] CDC, National Antimicrobial Resistance Monitoring System for Enteric Bacteria (NARMS) website at https://www.cdc.gov/narms/faq.html; M. Barza and S.L. Gorbach, *The Need to Improve Antimicrobial Use in Agriculture: Ecological and Human Health Consequences,* Clinical Infectious Diseases (2002).

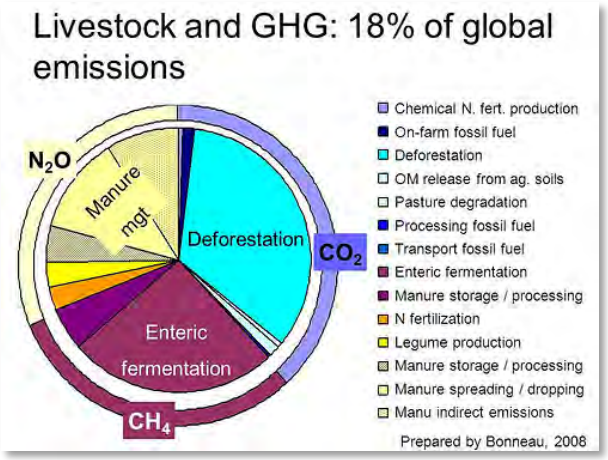
[52] University of Chicago Medicine, MRSA Research Center webpage at http://mrsa-research-center.bsd.uchicago.edu.

[53] CDC, National Antimicrobial Resistance Monitoring System for Enteric Bacteria (NARMS) website at https://www.cdc.gov/narms/faq.html;

In addition, the American Public Health Association, the American Medical Association, the American Academy of Pediatrics, the Infectious Disease Society of America, and the World Health Organization have all issued statements calling for restrictions on sub-therapeutic uses of antibiotics in livestock.[54]

Climate Change

About 70 billion farm animals are raised annually worldwide, 10 billion in the U.S. alone, and **more than 6 million are killed for food every hour**.[55] These farm animals consume a lot of resources, produce a lot of waste and, as the United Nations Food and Agriculture Organization (FAO) concludes are "one of the top two or three most significant contributors to the most serious environmental problems, at every scale from local to global" including climate change.[56]



According to the FAO, livestock production is responsible for between 14.5% and 18% of global greenhouse gas emissions (GHGs), which is more than all of our trucks, cars, planes, trains and other forms of transportation combined.[57] These emissions are due to deforestation to grow feed crops, which releases CO2 and removes a carbon sink, animal slaughter and processing, livestock transport, and release of methane which has a global warming potential 86 times that of CO2 on a 20-year time frame. According to the Intergovernmental Panel on Climate Change (IPCC), methane emissions from livestock production are projected to increase 80% by 2050 meaning that even without fossil fuel use, we will exceed the 565 gigatonnes CO2e limit by 2030, all from raising animals for food.[58]

Animal Cruelty[59]

The billions of animals raised and killed each year for meat, eggs, and milk are sentient, complex beings, and capable of feeling pain and frustration, joy, and excitement just like our dogs and cats. Yet, they are viewed by the meat industry as commodities and, as a result, suffer a myriad of assaults to their physical, mental, and emotional well-being. Unfortunately, there are no federal laws that protect farmed animals from this cruelty and the majority of states, including Indiana, exempt the industry's "accepted agricultural practices"—no matter how abusive—from the scope of their animal cruelty statutes. **Simply put, the treatment of factory-farmed animals and the conditions in which they are raised, transported, and slaughtered are inhumane and cruel, yet legal.**

For instance, birds raised for meat are confined by the tens of thousands in grower houses, which are artificially lit, force-ventilated, and completely barren except for long rows of feeders and drinkers. Due to selective breeding these birds grow unnaturally fast and large (typically in 47 days, although their lifespan is up to 8 years) causing gait defects,

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[54] Louis J. Kraus, M.D, Report of the Council on Science and Public Health, *Combating Antibiotic Resistance: An Update,* American Medical Association CSAPH Report 3-I-15 (2015); Landers & Cohen, et. al., *A Review of Antibiotic Use in Food Animals: Perspective, Policy and Potential,* Public Health Report 127(1):4-22, National Institutes of Health (Jan. 2012).

[55] Dr. Richard Oppenlander, *Food Choice and Sustainability: Why Buying Local, Eating Less Meat, and Taking Baby Steps Won't Work,* Landon Street Press, Minneapolis, MN (2013).

[56] Koneswaran & Nierenberg, *Global Farm Animal Production and Global Warming: Impacting and Mitigating Climate Change,* Environ Health Perspect 116(5): 578-582 (May 2008).

[57] Stehfest, Bouwman, et.al., *Climate benefits of changing diet*, Climate Change 95:1-2 (July 2009).

[58] Gerber, Steinfeld, et. al., *Tackling climate change through livestock – A global assessment of emissions and mitigation opportunities*, Food and Agriculture Organization of the United Nations (FAO) (2014).

[59] Except for specifically footnoted sources of data, the information in this section is drawn from the wealth of data and studies compiled by the Humane Society of the United States (HSUS) on the abuse of animals in the meat, egg, and dairy industries available at https://www.humanesociety.org/farm-animal-welfare.

broken bones, and severe pain. Once they reach market weight, these birds are stuffed in crates for transport where they often suffer dislocated and broken hips, legs, and wings, as well as internal hemorrhages. Also, during transport to slaughter, these birds—like other factory-farmed animals—are not given any food or water and are afforded little protection from extreme temperatures. At the slaughter plant, the birds are uncrated, dumped onto conveyors, and hung upside-down in shackles by their legs, as they pass through an electrified water bath before their throats are cut, usually by machine. Due to the rapid speed of slaughter lines (up to 8,400 chickens per hour), mistakes occur leaving some birds still conscious as they enter tanks of scalding water intended to loosen their feathers.

Chickens in the egg industry also suffer immensely, beginning right after hatching. Male chicks are considered useless "byproducts" because they are unable to lay eggs and are not bred for meat production. As such, millions of baby chicks each year are gassed, macerated, and sucked through a vacuum system, or thrown into garbage bins (as seen in the photo) where they are left to die from dehydration or asphyxiation.

In turn, female chicks are mutilated without any pain relief when the tips of their beaks are seared off with a hot blade to prevent them from pecking and engaging in other harmful behaviors that result from intensive confinement. For that matter, most egg-laying hens are confined in small, wire "battery cages" that are stacked several tiers high and extending down long warehouses. In these battery cages, hens are given less space than the area of a letter-sized sheet of paper in which to eat, sleep, lay eggs, and defecate. This makes it impossible for them to spread their wings or engage in natural behaviors such as dustbathing, foraging or nesting.

The more than 235 million pigs[60] slaughtered annually in the United States do not fare much better. Sows are put through consecutive cycles of impregnation, giving birth, and nursing, all while intensively confined. Although pigs are intelligent and highly social animals, pregnant sows are kept in metal "gestation crates" that are so small that they are unable to even turn around. Right before giving birth, the sows are moved to equally restrictive "farrowing crates," designed to keep them from crushing their nursing piglets. However, the crates are so small, they can only stand up and lie down. Then, after the piglets are weaned, the cycle begins again for the mother pig who churns out an average 2.5 litters each year until she can no longer reproduce and is sent to slaughter.

Annually in the U.S., approximately 32 million cattle are raised for beef, 9.5 million cows for milk, and around 360,000 calves for veal.[61] Cows in the dairy industry endure endless cycles of artificial insemination, mechanized milking, and giving birth. Many are routinely given hormones to increase milk production. The amount of work done by an average dairy cow during peak lactation is so immense it is comparable to a human jogging for six hours every day, almost year-round. Although cows can naturally live for more than 20 years, the average dairy cow is "spent" and sent to slaughter before she reaches the age of five.

To continue producing milk, dairy cows must continuously give birth, but male calves are of no value to the dairy industry. Consequently, within the first few days of life, male calves are taken from their mothers and raised for veal where they are intensively confined and tethered in stalls so small they unable to turn around for their entire 16-18 week lives before slaughter. These are just a few of the livestock industry's incredibly cruel and inhumane practices that treat animals as commodities for profit instead of living, feeling creatures.

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[60] USDA, 2017 Census of Agriculture.
[61] *Id.*

ECONOMIC IMPACTS-DISPELLING INDUSTRY MYTHS

Factory farms are often promoted locally through claims that they will bring economic vitality to the area. However, research shows otherwise. Loss of jobs, depressed property values, loss of income for local businesses and overall disruption of local social and economic systems, pollution problems and negative impacts on quality of life often result when factory farms move into rural communities.[62]

CAFOs Do Not Create Jobs

Instead of being independent entrepreneurs, many farmers are now "contract growers" for large corporations (i.e., Tyson, Smithfield, Cargill, JBS) that dictate all decisions including design of confinement buildings and equipment, genetics and reproduction, feeding, animal density, veterinary care, slaughter, processing, marketing, distribution, and virtually every other aspect of the livestock production process. Rather than create jobs for the local economy, this system of vertical integration which focuses on maximizing corporate profits tends to reduce local jobs due in part to the highly mechanized nature of raising livestock in a factory-like setting.

In fact, studies show that every CAFO worker replaces nearly three independent family farms.[63] Furthermore, what jobs do exist on CAFOs typically come with low wages and undesirable working conditions, leaving them staffed by migrant workers who spend little money in the communities where they work.[64]

Local businesses that support farming are also negatively affected by the proliferation of CAFOs. Communities with factory farms have higher rates of unemployment because corporations that control CAFO operations typically require their contract growers to buy feed and supplies through the corporation rather than local businesses. In fact, an Iowa study found that roughly 70% of smaller livestock operations bought feed locally, but only 43% of large-scale operations bought local feed.[65]

In addition, the livestock raised on CAFOs are often slaughtered and processed at a facility owned by the corporation. This further degrades the local economy by taking business away from independent slaughterhouses, regional processing firms, local grain elevators, and local feed and farm equipment dealers that would otherwise be able to provide employment opportunities, invest money locally and create the economic "multiplier effect" that occurs when farmers buy their supplies locally and the money stays within the community.[66]

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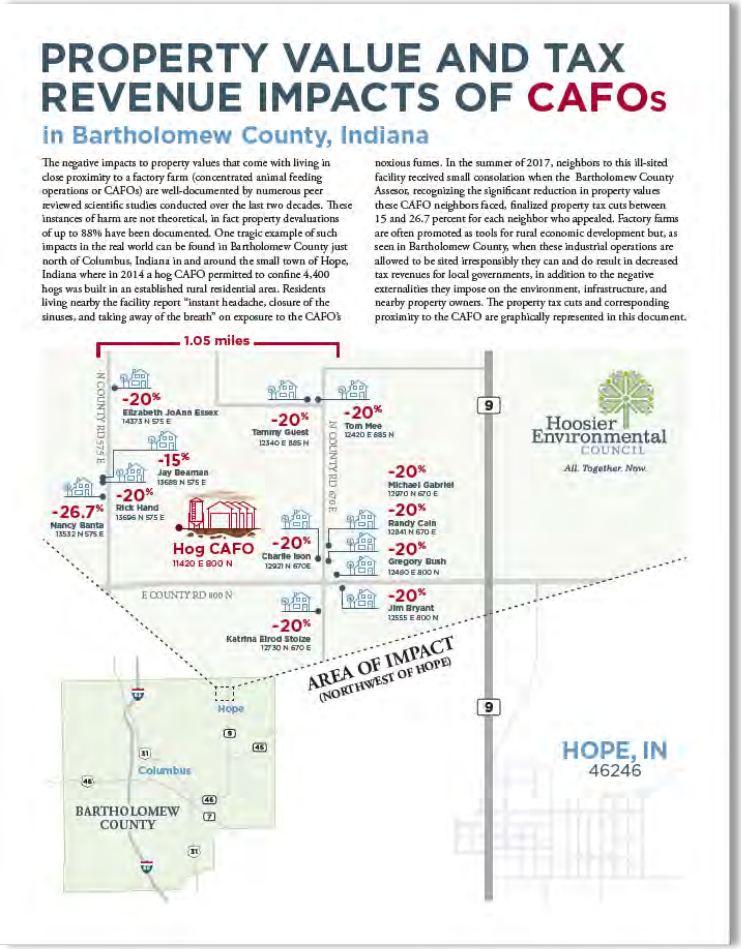
[62] Gomez & Zhang, *Impacts of Concentration in Hog Production on Economic Growth in Rural Illinois,* Illinois State University working paper presented to the American Agricultural Economics Association (July 2000).
[63] J.E. Ikerd, *Economic Fallacies of Industrial Hog Production,* University of Missouri (2001).
[64] *Id.*
[65] Food and Water Watch, *Factory Farm Nation: How America Turned It's Livestock Farms into Factories* (2012).
[66] J.E. Ikerd, *The Inevitable Economic, Ecological, and Social Consequences of CAFOs,* University of Missouri (Mar. 2013).

CAFOs Do Not Generate Tax Revenue

The reality is that CAFOs place a burden on county governments and taxpayers. For starters, proximity to a CAFO can reduce the value of a home by as much as 88% depending on distance from the CAFO and prevailing winds.[67] Study after study show that degradation in air quality which impacts homeowners' enjoyment and use of their property will have a measurable, direct, and statistically significant impact on property values.[68]



One study found that "only landfills have a worse effect [than CAFOs] on adjacent property values" and that "a sewage treatment plant has a less depressing effect on nearby housing prices [than a CAFO]."[69] Even Indiana's own Purdue University found in conducting a literature review that:

Market prices for homes are expected to decline the closer the home is the CAFO. A downwind home will realize a significantly larger decline in value relative to a home upwind that is the same distance from the CAFO. These potential inequities . . . indicate that communities and operators must choose to site CAFOs in a manner that either minimizes differential impacts on home values or compensates those individuals disproportionately impacted.[70]

This loss in property value can affect tax assessments and county tax revenues as seen Bartholomew County, Indiana, where the county assessor granted property tax cuts for residents who suffered property value losses due to a newly built CAFO. In addition, CAFOs do not pay for the damage they cause to county roads and infrastructure -- or for the health costs, accidents, and environmental damage they cause. Instead, these are all financial drains that must be supported by the community's tax revenue.

CAFOs Do Not Promote Economic Development

No. Studies indicate that the concentration of corporate control and industrialization of agriculture are associated with economic decline, both locally and regionally.[71] A study prepared by the Indiana Business Research Center touted the economic benefits of expanding livestock production in central Indiana -- a region covering 16 counties. This study, prepared at the request of the Indiana Soybean Alliance, a powerful agribusiness lobbying organization,

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[67] Hamed, Mubarek, et. al., *The Impacts of Animal Feeding Operations on Rural Land Values,* Univ. of Missouri-Columbia Community Policy Analysis Center Report R-99-02 (May 1999).

[68] *See* Kiel & Boyle, *Hedonic Studies of the Impact of Environmental Externalities,* Journal of Real Estate Literature 9-2, 117-144 (2001); *see also* D. Aiken, *Property Valuation May Be Reduced by Proximity of Livestock Operation,* Cornhusker Economics, Dept. of Agricultural Economics, University of Nebraska-Lincoln (May 2002) (finding odors from a CAFO with 5,200 sows diminished values of residential properties within ¾ mile by 30%); K. Milla, et. al., *Evaluating the Effect of Proximity to Hog Farms on Residential Property Values: a GIS-Based Hedonic Price Model Approach,* URISA Journal, 17(1):27-32 (2005).

[69] A. Ready, et. al., *The Impact of Open Space and Potential Local Disamenities on Residential Property Values in Berks County, Pennsylvania,* American Journal of Agricultural Economics 87:314-326 (May 2005).

[70] R. Keeney, *Community Impacts of CAFOs: Property Values,* Purdue Extension, Purdue University (2008).

[71] John Ikerd, *The Economics of CAFOs & Sustainable Alternatives,* University of Missouri-Columbia (Oct. 2009).

estimates that every $3.15 million in additional regional livestock sales would provide $701,000 in new income and create 28 new jobs in the region.[72] As impressive as that may seem, when averaged over the 16 county region, these figures are less promising; namely, a $3 million increase in livestock sales would provide merely $43,812.50 in new income and create just under two (2) new jobs per county -- hardly, a windfall return on investment. Factor in the negative externalities that CAFOs impose on the environment, public health, quality of life, property values, and local roads and bridges and the industry's promise of economic development is an empty one.

On the other hand, investing in a clean healthy environment with open spaces and quality outdoor recreation amenities drives tourism, creates good-paying jobs, and provides enumerable economic development opportunities. In Indiana, outdoor recreation generates: $15.7 Billion in consumer spending, 143,000 direct Indiana jobs, $4.3 Billion in wages and salaries, and $1.1 Billion in state and local tax revenue.[73] Indeed, more direct jobs in Indiana depend on outdoor recreation (143,000) than on agriculture (108,000).[74]

Without a doubt, investing in a clean, healthy environment, and quality outdoor recreation amenities leads to improved health outcomes, boosts property values, attracts new businesses, and enhances quality of life for residents, while making any community – rural or urban – a more attractive place to live. Allowing more CAFOs to spoil the land, air and water quality with massive amounts of untreated animal waste – more than the human population produces -- will predictably do just the opposite.

UNDERSTANDING THE FAILURE OF CURRENT LAWS

Gaps in State and Federal Environmental Regulations

The regulatory chart included as an Appendix to this Guide provides an easy reference to applicable federal and state environmental regulations, and what they do and do not address. Below is a more detailed summary of these rules demonstrating the many gaps in regulation that leave our air, land, waterways, and health unprotected from factory farms.

EPA Lacks Authority to Regulate CAFOs Under the Clean Water Act

A CAFO that discharges pollutants to waters of the U.S. is considered a "point source" and subject to permitting under the federal Clean Water Act (CWA).[75] However, in 2011, a federal appeals court decision largely gutted the U.S. EPA's authority to regulate CAFOs by vacating a provision that gave EPA (or state agency) the authority to determine whether a proposed new CAFO would discharge and require a CWA permit.[76] Now, the CAFO operator gets to make

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[72] Indiana Business Research Center, *The Economic Impact of Animal Agriculture in Indiana,* Indiana University, Kelly School of Business, (March 2017) (prepared for the Indiana Soybean Alliance). And note: these figures refer to estimated benefits of expanding hog production in the central Indiana region.

[73] Outdoor Industry Association, Indiana information at https://outdoorindustry.org/wp-content/uploads/2017/07/OIA_RecEcoState_IN.pdf.

[74] *Id.* (citing to figures from the Indiana Economic Development Corporation).

[75] 40 CFR 122.23

[76] *Nat'l Pork Producers Council v. United States EPA*, 635 F.3d 738 (5th Cir. 2011).

that determination. As a result, all of Indiana's CAFO operators have unsurprisingly decided their facilities do not require federal CWA permits.

Indiana's Confined Feeding Law Fails to Protect Public Health & Environment

Without EPA oversight, all of Indiana's factory farms—regardless of size—are subject only to the state's confined feeding laws.[77] The Indiana Department of Environmental Management (IDEM) implements these requirements, which are detailed in the agency's *Guidance Manual for Indiana's Confined Feeding Program*[78] and provide little protection for the environment and public health.

The state's confined feeding rules (CFO Rule) require 180 days of waste storage—unlined "earthen" lagoons are perfectly acceptable. When the lagoons are full, the CFO Rule allows waste to be sprayed or spread untreated on surrounding land subject to minimal setbacks from waterways and property lines. Although spreading waste on frozen or snow-covered ground is generally prohibited, there is an exception for "emergency situations," such as when a waste lagoon becomes full over the winter months.

Of particular concern, the CFO Rule allows CAFOs to be built in karst areas,[79] and located just 100 feet from on-site water wells and property lines, 300 feet from surface waters, drainage inlets, sinkholes and off-site water wells, 400 feet from homes and buildings, and 1,000 feet from a public water supply or intake structure. And as IDEM readily admits, the agency has no authority to regulate odors or air emissions from CAFOs, where CAFOs can locate, groundwater use, disease vectors (i.e., flies), or consider a CAFO's impact on property values.[80] Consequently, as long as a proposed new or expanding CAFO meets the CFO Rule's meager requirements, IDEM has no authority to deny a permit to protect surrounding neighbors from these impacts. For that matter, IDEM has not denied a single permit since the CFO Rule was enacted in 2012.

Procedurally, when applying for a permit to build a new CAFO or expand an existing one, the developer need only make a "reasonable attempt" to provide notice to people living within a half-mile the CAFO's structures, which then triggers a 33-day public comment period. However, IDEM does not have to consider or respond to public comments received in its decision-making. Once permitted, the CFO Rule requires an IDEM inspection only once every five (5) years, and the CAFO's required operating records, including records identifying how much waste is applied, how often, and where, are kept by the operator and not made available to the public. Thus, Indiana's CFO Rule not only fails to adequately protect public health and the environment, it lacks any meaningful mechanism for transparency, public accountability, or enforcement.

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[77] *See* Ind. Code § 13-18-10; 327 IAC 19; and 327 IAC 15-16.

[78] https://www.in.gov/idem/cfo/files/guidance_manual_cfo_program.pdf

[79] "Karst is a type of landscape where the dissolving of the bedrock has created sinkholes, sinking streams, caves, springs and other characteristic features. . . Because of the porous (swiss cheese-like) nature of karst, water flows quickly through it and receives little filtration. Therefore, contaminants that enter a karst aquifer are rapidly transported creating water quality problems . . . 40% of groundwater used for drinking water comes from karst aquifers. [Therefore,] it is imperative for our health and safety to protect karst landscapes." Natural Park Service, *Caves and Karst,* at https://www.nps.gov/subjects/caves/karst-landscapes.htm.

[80] https://www.in.gov/idem/cfo/2342.htm (listing what "IDEM Does Not Regulate")

Onsite "Composting" of Dead Animals Allowed

The Indiana Board of Animal Health (BOAH) regulates the disposal of a CAFO's dead animals under 345 IAC 7-7. Authorized methods of disposal include, among others, onsite "composting," which is nothing more than stacking the dead animals and covering them with a mixture of soil and sawdust. The resulting leachate from decomposing animal carcasses can negatively impact surface water and groundwater. And if an animal dies of an infectious disease, pathogens and viruses may be present in the carcass, thereby increasing risk of disease transmission.

The "Spill Rule" Applies Only to AFOs (Not Permitted CAFOs/CFOs)

The spill rule imposes reporting, containment, and response requirements to those responsible for spills of hazardous substances, petroleum, and "objectionable substances" that damage waters of the state.[81] "Objectionable substances" include livestock waste. For permitted CFOs/CAFOs, compliance with an approved "Emergency Response Plan" will constitute compliance with the spill rule. However, for unpermitted AFOs, the spill rule applies and requires immediate response using the most effective containment action possible, report of the spill to IDEM within 2 hours of discovery, and notification of neighbors and downstream water users. Moreover, a spill by an unpermitted AFO would likely be considered an unpermitted discharge subject to citizen enforcement under the Clean Water Act.[82]

No Limits on Factory Farm Air Pollution

Air emissions from factory farms usually come from: the ventilation stacks of the confinement buildings, outdoor waste lagoons, and from the manure spread on fields. In addition to extreme odors, factory farms release dangerous compounds into the air, such as hydrogen sulfide, ammonia, methane, and VOCs. Despite numerous scientific studies conducted over decades showing that CAFOs generate noxious air emissions that threaten the health of neighbors,[83] **CAFOs remain unregulated under federal or state clean air laws**.[84]

While some counties in Indiana have established greater setback distances for factory farms from residences and public spaces than what IDEM requires, research shows that odor plumes can travel well over 3 miles, depending on the atmospheric conditions.[85] In other words, there is a serious gap in environmental regulation of CAFOs with respect to addressing the dangerous air emissions they produce.

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[81] 327 IAC 2-6.1

[82] Later Sections in this Guide provide a more detailed discussion of citizen suits.

[83] *See e.g.,* Wing, Horton, et. al., *Air pollution and odor in communities near industrial swine operations*, Environ Health Perspect, *116*(10), 1362-1368 (2008); Wilson, S. M., & Serre, M. L., *Use of passive samplers to measure atmospheric ammonia levels in a high-density industrial hog farm area of eastern North Carolina,* Atmospheric Environment, *41*(28), 6074-6086 (2007); Schiffman, Miller, et. al., *The effect of environmental odors emanating from commercial swine operations on the mood of nearby residents*, Brain Research Bulletin, *37*(4), 369-375 (1995); Schiffman, Bennett, et. al., *Quantification of odors and odorants from swine operations in North Carolina,* Agricultural and Forest Meteorology, *108*(3), 213-240 (2001); Herriges, Secchi, et. al., *Living with hogs in Iowa: The impact of livestock facilities on rural residential property values*, Land Economics, 81, 530–545 (2005).

[84] IDEM, Confined Feeding Operations (describing "What IDEM Does Not Regulate") at http://www.in.gov/idem/landquality/2349.htm#idem-no-regulate; *see also*, Hoover, *Can't You Smell That Smell? Clean Air Act Fixes For Factory Farm Pollution,* Stanford Journal of Animal Law & Policy, Vol. 6 (2013).

[85] C. Hribar, *Understanding Concentrated Animal Feeding Operations and Their Impact on Communities,* National Association of Local Boards of Health, p. 7 (2010).

In 2017, a federal court confirmed EPA's authority under the Emergency Planning and Community Right-to-Know Act ("EPCRA") to require large CAFOs that release in excess of 100 pounds of ammonia per day to report those hazardous releases to local and state emergency planning authorities in accordance with Section 304 of EPCRA.[86] Notably, the livestock industry had long known about this requirement and even prepared an EPCRA "Fact Sheet" as well as an "Ammonia Emissions Estimator Worksheet" for CAFO operators to use in determining whether they must report their emissions,[87] but then vigorously fought having to comply. Unfortunately, the Trump Administration's EPA undermined this legal win by signing a final rule in 2019 that exempts CAFOs from having to report their hazardous emissions under EPCRA. Making matters worse, Congress passed the "Fair Agricultural Reporting Method Act (FARM Act)," which similarly exempts CAFOs from having to report their hazardous emissions under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA),[88] leaving rural communities completely in the dark as to what they are being exposed to.

Local Zoning and Land Use Law - A Race to the Bottom

Zoning law is the process of regulating land use within a town, city, or county. Indiana's zoning law follows traditional "Euclidean zoning" wherein land is divided into use districts that restrict where industrial, commercial, agricultural, residential, and other defined land uses are allowed. This style of zoning was upheld as constitutional in 1926 in the United State Supreme Court case of under the states' police power for protection of the public health, safety, welfare, and morals,[89] notably not for the promotion or protection of special industry interests. Under Indiana law, broad discretion is afforded to local governments to regulate land use within their jurisdictions (a principle known as "Home Rule"). Despite this broad authority, there are just a handful of counties that have actually exercised that authority to protect their citizens from CAFOs. And not surprisingly, the counties with the weakest ordinances have the highest number of CAFOs.[90]

Barriers to Legal Remedies - Indiana's Right to Farm Act (RTFA)

Under Indiana law, a lawsuit may be brought by any person whose property is injuriously affected or personal enjoyment is lessened by the nuisance.[91] A trial court may award injunctive relief to abate the nuisance and may award damages.[92] Unfortunately, these remedies have been eliminated for Hoosiers suffering from CAFOs by the RTFA.[93]

Like other states, Indiana enacted the RTFA to protect existing farms from urban sprawl by barring unjustified nuisance suits by newcomers who "moved to the nuisance.[94]" **However, due to successful lobbying by the powerful meat industry, these laws have been amended to shield newly built factory farms from nuisance lawsuits brought by neighbors who were there first**.[95] Such is the case in Indiana where the RTFA was amended in 2005 to redefine what it means for an agricultural operation to undergo a "significant change" that would otherwise remove the RTFA's protection.

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[86] *Waterkeeper Alliance v. EPA,* No. 09-1017 (D.C. Cir. April 11, 2017) (upholding EPA's 2008 Final Rule at 73 Fed. Reg. 76948, 76952-53 under EPCRA, 42 U.S.C. § 1101 et. seq., 40 C.F.R. § 355.31(g)).

[87] The National Pork Producers Council prepared the *CERCLA-EPCRA Fact Sheet* (Jan. 14, 2009). The *Koelsch and Stowell Ammonia Emissions Estimator Worksheet* is available at https://www.kla.org/Media/KLA/Docs/epcra_ammonia_swine.pdf.

[88] https://www.epa.gov/epcra/cercla-and-epcra-reporting-requirements-air-releases-hazardous-substances-animal-waste-farms

[89] *Village of Euclid v. Ambler Realty Company*, 272 US 365 (1926).

[90] See discussion above on pages 4-5 regarding Indiana's factory farms.

[91] Ind. Code § 32-30-6-7

[92] Ind. Code § 32-30-6-8

[93] Ind. Code § 32-30-6-9

[94] *See* J. Hand, *Right-to-Farm Laws: Breaking New Ground in the Preservation of Farmland*, 45 U. PITT. L. REV. 289, 290–93 (1984).

[95] *See* Leah Douglas, *Big Ag is Pushing Laws to Restrict Neighbors' Ability to Sue Farms,* NPR (Apr. 12, 2019); *see also* L. Ashwood, et al., *Property Rights & Rural Justice: A Study of U.S. Right-to-Farm Laws*, 67 J. RURAL STUDIES 120, 127 (2019).

Now, a "significant change" no longer includes a change from growing crops to warehousing 8,000 hogs in a CAFO regardless of the harm caused to existing neighbors. Instead, neighbors who purchased their homes decades before CAFOs even existed or the RTFA was enacted are now deemed to have "moved to the potential future nuisance" and, therefore, retroactively lose their vested property rights when a CAFO is built next door. *Himsel v. Himsel,* 122 N.E. 3d 935, 944 (Ind. Ct. App. 2019) (emphasis added). Unfortunately, the Indiana Court of Appeals recently took this a step further and held that **the RTFA bars not only nuisance claims by existing neighbors, but negligence and trespass claims too.** *Himsel,* 122 N.E.3d at 943-945.

Particularly concerning, the appeals court concluded that **the decision to locate a CAFO on vacant cropland next to long-established homes—no matter how *unreasonable* and knowingly harmful that decision is—"cannot constitute negligent operation under the RTFA."** *Himsel,* 122 N.E.3d at 945. Instead, the only way to demonstrate negligence is to show that the CAFO does not comply with regulations. *Id.* at 944–45. The problem with this is that a CAFO's regulatory compliance does *nothing* to alleviate the harm caused to neighbor. Neither the EPA nor IDEM has the regulatory authority to restrict or limit the dangerous and extremely noxious airborne chemical compounds that CAFOs produce. That means, so long as a CAFO with 8,000 hogs operates pursuant to the very regulations that allow it to confine 8,000 hogs, produce millions of gallons of feces, urine, and other animal wastes each year, and blow the resulting stench and waste particles onto neighboring homes, such a harmful CAFO is not negligent.

Finally, even though the appellate court held that **neighbors have no right to bring a trespass claim for the "unlawful *physical* intrusion" of a CAFO's noxious emissions into their properties and homes,** it nevertheless concluded that the RTFA is not an unconstitutional taking of the neighbors' property rights. *Id.* at 946-948. In so doing, the court acknowledged that the neighbors in *Himsel* have suffered substantial property value losses, and that their "property rights are clearly affected" due to the CAFO. *Id.* at 947. Even so, the court concluded that no taking has occurred because they had "not been deprived of all or substantially all economic or productive use of their properties." *Id.* at 947-948.

The neighbors, represented by HEC, argued to the Indiana Supreme Court (photo), that the appeals court decision in *Himsel* is at odds with long-standing precedent confirming that when a law "requires an owner to suffer a permanent physical invasion of her property—however minor—it must provide just compensation," because the right of exclusive possession is "perhaps the most fundamental of all property interests." *Lingle v. Chevron U.S.A. Inc.,* 544 U.S. 528, 539 (2005) (citing *Loretto v. Teleprompter Manhattan CATV Corp.,* 458 U.S. 419, 433 (1982).

Unfortunately, the Indiana Supreme Court decided not to review Indiana's RTFA, ending a costly and stressful five-year legal battle that the neighbors were forced to bring because government agencies were unable or unwilling to help. And, because the Indiana Appeals Court ruling in their case now stands, the legal system is a dead end for them too. For that matter, without the assistance of HEC's non-profit legal aid, these families would not have been able to even access the courts in the first place.[96]

[96] *See Citizens Lack Affordable Legal Services. HEC is Addressing Indiana's Environmental Justice Gap* at https://www.hecweb.org/technical-legal-assistance/.

THERE ARE SOLUTIONS - TAKE ACTION

Our unsustainable, inhumane, and inequitable industrial food system was not created overnight. It was created during a period of 50 years, primarily between the 1950s and 1990s, through government policies and voluntary changes in farming and food choices one farmer and one consumer at a time. A new resilient and sustainable food system can be recreated much more quickly—once people become aware of the need for systemic change and take action. We have identified several steps you can take now.

Demand Common Sense Regulatory Reform

Given the significant gaps in environmental regulation of factory farms, it is imperative that we demand our state lawmakers to pass legislation that will:

- Give IDEM authority to deny a permit to build or expand a CFO/CAFO to protect human health and the environment from the operation's air emissions (IDEM has no such authority now);
- Impose greater setbacks (at least a mile) from residences, schools, businesses, churches, parks and other public places (for all CFO/CAFO structures and land application activities) or if such a setback is not possible, require the developer to fairly compensate impacted property owners;
- Impose greater setbacks from lakes, streams, wetlands, and other environmentally sensitive areas (for all CFO/CAFO structures and land application activities);
- Prohibit construction or expansion of CFO/CAFOs in karst areas and flood plains (as is allowed now);
- Set air pollution limits for CFO/CAFOs to restrict their dangerous emissions of hydrogen sulfide, ammonia, amines, volatile fatty acids and other odorous compounds;
- Require use of BMPs to control erosion and runoff (vegetative buffers, etc…) from production and land application sites;
- Include a public nuisance provision that would allow IDEM to revoke a CFO/CAFO permit if the operation becomes a public health or environmental threat or a nuisance to its neighbors;
- Require disclosure of all persons/entities in control of a CFO/CAFO including the integrator, and owner of the animals along with full disclosure of their environmental track records;
- Require IDEM to actually consider and respond to public concerns in deciding whether to issue a permit.

Advocate for Legislation that Restores Property Rights of Rural Citizens

Indiana's RTFA strips the property rights of rural Hoosiers when a polluting factory farm moves in next door. Accordingly, we must demand our state lawmakers to amend the RTFA to:

- make clear that a decision to turn vacant cropland into a polluting factory farm that makes living conditions untenable for neighbors is a significant change that removes the RTFA's protections;
- make clear that irresponsibly siting a factory farm in a place that the developer knows will cause harm to existing neighbors is negligence that will remove the RTFA's protection.

Everything you need to know to get involved in pushing for these legislative reforms is available through HEC's Bill Watch page at https://www.hecweb.org. The 2022 legislative session will begin in January. When it

does, HEC will spotlight important bills and calls-to-action on this page. **For real time updates,** make sure to follow us on Facebook (www.facebook.com/hecweb) and Twitter (https://twitter.com/HEC_ED) and sign up for our Action Alerts at https://www.hecweb.org/get-involved/. **To find your state legislators go to** http://iga.in.gov/legislative/find-legislators/

Push Congress to Enact the "Farm System Reform Act"

U.S. Senator Cory Booker has introduced legislation called the "Farm System Reform Act" to ensure a level playing field for all farmers and ranchers. The Bill is supported by more than 300 sustainable farming groups, animal welfare, environmental and public health organizations (including HEC and Indiana Farmers' Union).[97] Also promising, a recent survey by the Johns Hopkins Center for a Livable Future found that a majority of registered voters support greater oversight of factory farms.[98] The Farm System Reform Act would do just that by, among other things:

- strengthening the Packers & Stockyards Act (anti-trust law) to crack down on the monopolistic practices of multi-national meatpackers and corporate integrators;
- placing an immediate moratorium on new and expanding large CAFOs, and phasing out by 2040 the largest CAFOs as defined by EPA;
- holding corporate integrators responsible for pollution and other harm caused by CAFOs;
- providing a voluntary buyout for farmers who want to transition out of operating a CAFO;
- Restoring mandatory country-of-origin labeling requirements for beef and pork and expanding the requirements to dairy products;
- Prohibiting the USDA from labeling foreign imported meat products as "Product of USA."

Read the full text of the bill here: https://www.congress.gov/bill/116th-congress/senate-bill/3221/text

Locate your U.S. senators' contact information here:
https://www.senate.gov/general/contact_information/senators_cfm.cfm

Find your U.S. representatives' website and contact information here:
https://www.house.gov/representatives

Sign an on-line petition in support of the bill here: https://www.foodandwaterwatch.org/campaign/ban-factory-farms

Urge President Biden to Make Good on His Pledge to Strengthen Antitrust Enforcement

Before taking office, President Biden made the following pledge as part of his rural plan to "Build Back Better":

> ***Strengthen antitrust enforcement.*** *From the inputs they depend on -- such as seeds -- to the markets where they sell their products, American farmers and ranchers are being hurt by increasing market concentration. Biden will make sure farmers and producers have access to fair markets where they can compete and get fair prices for their products -- and require large corporations to play by the rules instead of writing them -- by strengthening enforcement of the Sherman and Clayton antitrust Acts and the Packers and Stockyards Act.*[99]

Consider writing a letter or emailing the White House at https://www.whitehouse.gov/contact/ and urge President Biden to make good on his pledge.

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[97] https://www.foodandwaterwatch.org/sites/default/files/fsra_sign-on_final_copy.pdf
[98] https://clf.jhsph.edu/about-us/news/news-2019/survey-majority-voters-surveyed-support-greater-oversight-industrial-animal
[99] *The Biden-Harris Plan to Build Back Better in Rural America* at https://joebiden.com/rural-plan/

Vote With Your Dollars: Support Local Foods

Indiana has always been a key center of agriculture for the country. As a leading agricultural state, it is time for us to look for a sustainable solution that nourishes everyone over the long term—the farmer, local residents, consumers, and the earth. **The answer: moving away from a commodity-based system and returning to a local food system.**

The local food system is one of the fastest growing, most promising markets in agriculture today and is based on one central idea: when food is grown, processed, and sold locally, it is better for farmers, better for communities, better for the environment, and – in both taste and nutrition—better for people. This is not new. In the early 1900s, almost all agricultural systems were local systems, but with innovations in technology over the 20th century, most of the local facilities, transportation, delivery systems and marketing connections have disappeared. Much of what remains is designed for agricultural scales well beyond the needs of local food.

A Local Food System Offers Fresher, Tastier, and More Nutritious Food

For consumers, local food is an opportunity to eat fresher, tastier food. Indeed, market studies indicate that a primary reason people buy local food is because it tastes better and is fresher than food bought at a grocery store. That's because food at the grocery store routinely travels from Florida, California, Mexico and overseas—on average, 1,500 miles from farm to plate.[100] When food travels that far, it can spend days or weeks in transit and, therefore, must be bred for shelf life and durability and/or treated with chemicals and preservatives. This not only reduces taste and freshness but has led to declines in nutrition value.[101] In contrast, food bought from a farmers' market, CSA, or co-op may be as fresh as this morning, eliminating the need for chemicals and preservatives. Because foods begin to lose nutritional value at the moment of harvest, fresher local foods retain more nutritional value and the farmer producing it has greater flexibility in selecting more flavorful, and often more nutritional, breeds and varieties.

A Local Food System Supports Farmers and the Local Economy

Aside from taste and freshness, another top reason consumers cite for buying local food is to support local farmers. In 2002, farmers earned their lowest real net cash income since 1940.[102] Indeed, nearly 90% of farm households rely on off-farm income just to get by while corporate agribusiness profits have nearly doubled since 1990.[103] By choosing to buy local, consumers **"vote with their dollars"** for a food system that aligns with their values such as family farms, community, a vibrant local economy, and sustainability.

Studies suggest that roughly one-third of consumers will pay a 5-20% premium for locally grown vegetables and meats, indicating the potential profitability of a local food system.[104] Combined with more labor-intense practices, a local food system can generate many times the net return per acre as common commodity crops.[105] Moreover, data

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[100] Iowa State University Extension, *Using Organic Agriculture and Sustainable Crops and Livestock in the Local Food System,* (Nov. 2005).

[101] *Id. at 4* (indicating that foods cultivated for longer shelf life and higher yields are less nutritious than many traditional breeds and varieties).

[102] *Id.* (citing USDA, Farm income and balance sheet statistics in constant U.S. dollars, 1929-2002. Economic Research Service.

[103] *Id.*

[104] Leopold Center for Sustainable Agriculture, *Eco-label Value Assessment: Consumer and Food Business Perceptions of Local Foods* (2003) available at http://www.leopold.iastate.edu/pubs/staff/ecolabels/index.htm.

[105] *Id.*

indicates that only 15% of the average consumer food dollar (in a commodity system) contributes toward the farm value of the food.[106] However, a local food system features direct farmer-to-consumer marketing meaning the farmer can capture more of the consumer food dollar while still offering a competitive price.

Local food purchases also have the effect of bolstering the local economy. A Minnesota study revealed that, in a region with over $866 million in sales of farm products in a given year, as much as $800 million of that did not stay in the region due to non-local consumer food purchases and non-local farm input purchases.[107] Even if a local food system could capture as little as 1% of that loss, that would be $8 million that stays in the region to support local farms, communities, and towns. The same study estimates that local food dollars cycle 2.3 times through the local economy, while dollars spent at large industrial farms only cycle 1.9 times.

A Local Food System Strengthens the Social Fabric of a Community

In addition to economic benefits, many social benefits are realized in a community with a robust local food system. Key among these are the relationships that local food systems build—relationships that connect people, establish lasting business ties, and create a sense of place and identity.

When shoppers know the farm that produces their food, when they know a chef, a nutritionist, a city official, and neighbors who buy locally, they feel a stronger connection and greater pride in place. Communities with a strong sense of place can—through farmers' markets, local festivals, and local character—develop attractive and profitable agri-tourism possibilities.

A Local Food System is Better for the Environment

A clear environmental benefit from a local food system is the markedly reduced use of fossil fuels for transport. Foods produced in a commodity system that travel across the country (or across oceans) before landing in a grocery store aisle, require significantly more fossil fuels to transport them than to grow them. Indeed, one study found that switching to a local food system would save 79-94% of the carbon dioxide emissions from food transport versus purchasing non-locally sourced foods.[108] In addition, a local food system is typically correlated with organic and sustainable practices aimed to provide cleaner water, soil conservation, odor reduction, and less pesticide and fertilizer use, wildlife diversity, and respect for neighbors who live nearby.

To get started, check out **Indiana's small farm co-ops and buying clubs such as Purple Porch Co-Op,[109] Homestead Heritage,[110] Seven Sons Meat Company,[111] Tyner Pond Farms[112] and others that connect Indiana farmers to local consumers year-round.**

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[106] Elitzak, Howard, *Food Marketing Costs: a 1990's Retrospective,* Economic Research Service, Food Review 23 (2003) available at http://www.ers.usda.gov/publications/foodreview/septdec00/FRsept00e.pdf.

[107] Meter, Ken, *Finding Food in Farm Country,* Crossroads Research Center (2001) available at www.crcwords.org/ff/pdf.

[108] Pirog, et. al., *Food, Fuel and Freeways: an Iowa Perspective on How Far Food Travels, Fuel Usage, and Greenhouse Gas Emissions*, Leopold Center for Sustainable Agriculture (2001).

[109] 123 Hill Street, South Bend IN -- offers online ordering with deliveries of milk, produce, eggs and meat when available.

[110] 5254 North 500 East, Kokomo IN 46901 -- a CSA which offers chicken, eggs, turkey, pork and dairy products including milk, butter, yogurt and kefir.

[111] 15718 Aboite Road, Roanoke IN 46783 -- has several buying clubs in Indiana and the Chicago area and offers beef, chicken, turkeys, pork with deliveries to these locations several times a year.

[112] https://tynerpondfarm.com

Ultimately, It's Up to You - Food Choice Matters

We've all learned about ways to reduce our own environmental footprints by making a variety of lifestyle changes such as: following the "three R's" – i.e., reduce, reuse, recycle, driving hybrid or electric cars, using public transportation, walking or biking when possible, installing renewable energy systems on our homes, installing energy efficient appliances, using energy efficient LED light bulbs, taking less and shorter showers with low flow shower heads, not watering our lawns, using collected rainwater in rain barrels if we have to water, insulating our homes, shopping at locally owned businesses, and making environmentally responsible investments. **But we rarely hear about the tremendous environmental impact that our food choices** have despite the fact that raising animals for food accounts for 18% of global GHGs, 80% of worldwide land use, 30% of global freshwater consumption, and is the leading cause of species extinction, ocean dead zones, water pollution, and habitat destruction.[113] Fortunately, that appears to be changing.

Every five years, the federal government publishes updated advice on what Americans should eat (think of the food pyramid). These dietary guidelines are based on recommendations from a panel of expert scientists who sit on the Dietary Guidelines Advisory Committee (DGAC).[114] This expert panel issued a 2015 report, which included the commonsense idea that our "food print" matters; that we as a nation ought to be making food choices for environmental as well as personal health reasons.

DGAC's recommendations, for the first time, highlighted the intersection between our dietary decisions and the impact of those decisions on the health of our environment--in other words, on our planet's ability to continue to provide us with the food we need to stay healthy for generations to come.[115] Of particular significance, the DGAC found that plant-based diets are not only consistently related with "positive health outcomes" including reduced risk of obesity, cardiovascular disease, cancer and other diseases but also has less environmental impact in terms of GHG emissions, land use, water use and energy use, compared to the average American diet that is high in animal-based foods.[116]

Indeed, of all the foods we eat, our meat, poultry and dairy products are by far the most resource-intensive and environmentally damaging to produce. 56% of fresh water consumption in the U.S. is attributed to livestock production[117] as compared to our private home water usage -- i.e., drinking water, doing dishes, taking showers, watering lawns – which accounts for a mere 5% of U.S. water consumption.[118] Similarly, nearly half of all land in the contiguous U.S. is directly or indirectly devoted to animal agriculture,[119] which makes sense given that it requires 2-5

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[113] Cowspiracy: the Sustainability Secret, *The Facts* (providing citation and links to peer-reviewed scientific studies, government and other credible sources) available at http://www.cowspiracy.com/facts/.

[114] https://health.gov/dietaryguidelines/committee/

[115] Office of Disease Prevention and Health Promotion, *2015-2020 Dietary Guidelines for Americans* (Feb. 2015).

[116] *Id.* at Executive Report

[117] M. Jacobson, *Six Arguments for a Greener Diet: How a More Plant-Based Diet Could Save Your Health and the Environment,* Ch. 4, Center for Science in the Public Interest (2006).

[118] *Id.*

[119] C. Glaser, et. al., *Costs and Consequences: the Real Price of Livestock Grazing on America's Public Lands,* Center for Biological Diversity (Jan. 2015).

acres to raise just one cow.[120] And notably, even though we currently grow enough food to feed 10 billion people,[121] 50% of food grown worldwide goes to feed livestock.[122]

This staggering inefficient use of resources is particularly disturbing from a humanitarian perspective given that 82% of starving children live in countries where food is grown to feed livestock that are eaten by people in western countries.[123] And, **15 times more protein can be produced on a given area of land by growing plants for direct human consumption rather than feeding it to livestock.**

To put the extraordinary impact our food choices have into perspective, consider that it takes only 1/6th of an acre to feed a vegan for a year, about half an acre to feed a vegetarian, but three acres to feed the average American meat-eater.[124] Furthermore, meat-eaters produce about twice as many dietary-related greenhouse gas emissions as vegans and vegetarians. People who eat 3.5 ounces of meat per day—about the size of a deck of playing cards—generate 15.8 pounds of carbon-dioxide equivalent (CO2e), whereas vegetarians and vegans are responsible for 8.4 pounds and 6.4 pounds of CO2e, respectively.[125] **Compared to the average meat-eater, a person who eats a plant-based diet saves 1,100 gallons of water, 45 pounds of grain, 30 square feet of forested land, 20 pounds of CO2 equivalent, and one animal's life every day.**[126]

The answer is clear. The world population is expected to grow from 7.2 billion today to 9.6 billion by 2050.[127] Although we are currently growing enough food to feed 10 billion people, most of that food is going to feed livestock. At current rates of meat consumption, we will need the resources of several more planets to feed the world in 2050, yet we only have one. **The choice is yours—consider reducing your meat consumption and adopting a more plant-based diet.**

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[120] McBride & Mathews, *The Diverse Structure and Organization of U.S. Beef Cow-Calf Farms,* USDA: Economic Research Service 73 (March 2011).

[121] E. Holt-Gimenez, *We Already Grow Enough Food for 10 Billion . . . and Still Can't End Hunger,* Common Dreams: Breaking News and Views for the Progressive Community (May 2012).

[122] UN, Food and Agriculture Organization, *Protein Sources for the Animal Feed Industry, Executive Summary: Feed Supply*

[123] UN, Food and Agricultural Organization, *Global livestock production systems* (2011); UNICEF, *Improving Child Nutrition: The Achievable Imperative for Global Progress* (Apr. 2013).

[124] Gordan, et. al., *Land, Irrigation Water, Greenhouse Gas, reactive Nitrogen Burdens of Meat, Eggs and Dairy Production in the United States,* Proceedings of the National Academies of Sciences 111:33 (June 2014)

[125] *Id.*

[126] Cowspiracy: the Sustainability Secret, *The Facts* (providing citation and links to peer-reviewed scientific and government studies and other credible sources) available at http://www.cowspiracy.com/facts/

[127] United Nations, Dept. of Economic and Social Affairs, *World population projected to reach 9.6 billion by 2050* (2013) at http://www.un.org/en/development/desa/news/population/un-report-world-population-projected-to-reach-9-6-billion-by-2050.html>.

STATE/FEDERAL REGULATION OF LIVESTOCK OPERATIONS IN INDIANA

Category of operation	Animal Feeding Operation (Confined animals but fewer than CFO threshold)	Confined Feeding Operation (At least 300 cattle, 600 swine or sheep, 30,000 poultry or 500 horses in confinement)	Concentrated Animal Feeding Operation (At least 700 dairy cows, 1,000 veal calves, 1,000 cattle, 2,500 swine, 10,000 sheep/lambs, 55,000 turkeys, 82,000 hens, 125,000 broilers, 5,000 ducks in confinement)
Number operating in Indiana	-Unknown #	~ 1,300	~ 690 (3 subject to federal law)
Odors	**Not regulated**	**Not regulated**	**Not regulated**
Air Pollutants (hydrogen sulfide, ammonia, particulate matter)	**Not regulated**	**Not regulated**	**Not regulated**
Rodents/Flies	**Not regulated**	**Not regulated**	**Not regulated**
Groundwater contamination (pathogens / nitrates)	**Not regulated** unless from manure spill	State regulated if from manure storage structures or production areas, but not from farm field run-off*	State regulated if from manure storage structures or production areas, but not from farm field run off. Federally regulated facilities must comply with NPDES permits which may have groundwater monitoring requirements.*
Groundwater use	**Not regulated**	**Not regulated**	**Not regulated**
Surface water contamination (pathogens / nutrients / sediments)	**Not regulated** unless from manure spill	State regulated if from manure storage structures or production areas, but not from farm field run-off*	State regulated if from manure storage structures or production areas, but not from farm field run-off. Federally regulated facilities must comply with manure management and storm-water management plans.*
Where a livestock operation can locate	**Not regulated**	**Not regulated**	**Not regulated**
Truck traffic	**Not regulated**	**Not regulated**	**Not regulated**
Property values	**Not regulated**	**Not regulated**	**Not regulated**

* For more detail, see HEC chart on Federal and State Regulation of Discharges From Indiana Livestock Operations

FEDERAL AND STATE REGULATION OF DISCHARGES FROM INDIANA LIVESTOCK OPERATIONS

	Animal Feeding Operations	Confined Feeding Operations	Concentrated Animal Feeding Operations
Type of permit	IDEM permit not required	Must obtain State "CFO Approval" from IDEM	CAFOs that discharge must obtain a federal NPDES permit; CAFOs that don't discharge may obtain either an NPDES permit or a "CFO Approval" from IDEM[†] (327 IAC 15-16-1)
Public notice of permit application for new facility or expansion	IDEM permit not required.	Must make "reasonable effort" to notify landowners within ½ mile of facility. Notice in newspaper not required (327 IAC 19-8-7).	Must notify all "potentially affected persons" and all adjoining landowners. Also, public notice in local newspaper required. (40 CFR 122.23)
Public participation in permit application process	IDEM permit not required	33-day public comment period; public "informational meeting" may be held at IDEM discretion; no requirement for IDEM to respond to comments. (327 IAC 19-8-7)	30-day (or longer, if necessary) public comment period. Public hearing may be held and IDEM must consider and respond to comments. (40 CFR 124.11 – 124.17)
Groundwater monitoring	No requirements	GWM may be required at IDEM discretion. If required, CFO owner/operator conducts sampling and reports only if statistically significant increase over background levels. (327 IAC 19-10-1)	Same as CFO rule.
Stormwater management	No requirements	"Good housekeeping" BMPs for storm water management and erosion/sediment control. (327 IAC 19-11-2)	Must meet storm water requirements in 40 CFR 122.23(e) and 40 CFR 122.42(e)(1) through 40 CFR 122.42(e)(2).
Manure storage structures – capacity & design requirements	None	180-day storage capacity and 2 feet freeboard required; must be designed to prevent surface water discharge; owner / operator inspection once a week (327 IAC 19-12-4; 327 IAC 19-13-1).	Same as CFO rule. However, existing CAFOs with 120-day capacity (per prior rule) can obtain variance.
Site restrictions for manure storage structures	None	Cannot be built in floodways or over mines. Can be built in karst terrain, 100-year flood plains and soil types expected to have a seasonal high water table. (327 IAC 19-12-2)	Same as CFO rule.

[†] Of the 690 CAFOs in Indiana, all but 3 are deemed not to have discharges and have elected to be subject to the State's "CFO Approval" requirements – none elected to stay in the federal NPDES program.

Setbacks for manure storage structures	None	1,000 ft. - public wells and intake structures; 300 ft. - surface water, drainage inlets, sinkholes, off-site wells; 100 ft. - on-site wells, property lines, public roads; 400 ft. - off-site residences and public buildings. (327 IAC 19-12-3)	Same as CFO rule.
Land application of manure	No requirements	Land must be owned/controlled by owner/operator (327 IAC 19-14-2); Application rates for P and N; No application on saturated, frozen or snow covered ground except in emergency situations or "case-by-case" basis with approval from IDEM (327 IAC 19-14-4); application setbacks in accordance with Ind. NRCS conservation practice standard 633 (327 IAC 19-14-6).	Must develop and follow a nutrient management plan that is enforceable and subject to public notice and comment requirements. (40 CFR 122.42(e))
Emergency Response	Must comply with "Spill Rule" (327 IAC 2-6.1)	Owner/operator must develop an Emergency Response Plan. Spill must be reported within 2 hours of discovery. (327 IAC 19-13-4). Spill from field run-off or land application done in accordance with rule is not a violation. (327 IAC 19-14-4)	Same as CFO rule.
Disposal of dead animals	May bury on premises at a depth of 4 feet, compost, or store until pick-up by licensed disposal service. (345 IAC 7-7-3)	Must comply with 345 IAC 7-7 and ensure dead animals or liquids from dead animals do not come in contact with ground and surface waters. (IDEM: 327 IAC 19-7-6)	Same as CFO rule.
Enforcement	State only	State only	State and Federal