



Factory Farm Nation

2015 EDITION

Food & Water Watch champions healthy food and clean water for all. We stand up to corporations that put profits before people, and advocate for a democracy that improves people's lives and protects our environment.

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TABLE OF CONTENTS

Executive Summary	2
Introduction	5
Dairy	7
Beef	9
Pork	11
Chicken	13
Eggs	15
Bad Policy Driving the Growth of Factory Farms.	17
The High Cost of Low-Priced Feed18
Weak Environmental Regulation.19
The High Cost of Factory Farms.	21
Water Pollution and Manure Spills21
Air Pollution and Odors22
Impact on Farmers23
Impact on Communities26
Impact on Consumer Prices27
Impact on Public Health28
Impact on Animal Welfare31
Conclusion	33
Appendix	35
Endnotes	38

Executive Summary

Over the last two decades, small- and medium-scale farms raising livestock have given way to factory farms that confine thousands of cows, hogs and chickens in tightly packed facilities. Farmers have adopted factory farming practices largely at the behest of the largest meatpackers, pork processors, poultry companies and dairy processors. The largest of these agribusinesses are practically monopolies, controlling what consumers get to eat, what they pay for groceries and what prices farmers receive for their livestock.

This unchecked agribusiness power, along with misguided farm policies, have pressed livestock producers to become significantly larger and to adopt more-intensive practices. Despite ballooning in size, many livestock producers are just squeezing by financially, because the real price of beef cattle, hogs and milk has been falling for decades.

These intensive methods come with a host of environmental and public health impacts that are borne by consumers and communities. Factory farms produce millions of gallons of manure that can spill into waterways from leaking storage lagoons or fields where manure is over-applied to soil. Manure generates hazardous air pollutants and contains contaminants that can endanger human health. Neighbors of these animal factories, as well as the workers in them, often suffer intensely from overwhelming odors and related headaches, nausea and other long-term health effects.

What Is a Factory Farm?

Beef cattle: 500 head on feed (feedlot)

Dairy: 500 cows

Hogs: 1,000 head

Broiler chickens: 500,000 sold annually

Egg-laying chickens: 100,000



Even people thousands of miles away from these facilities are not immune to their impacts. Thousands of animals crowded into facilities are vulnerable to disease. Consumers eating the dairy, egg and meat products from factory farms can be exposed inadvertently to foodborne bacteria such as *E. coli* and *Salmonella*, as well as to the public health consequences of unchecked antibiotics use. And yet, despite all of the well-documented problems and health risks related to this type of industrialized production, the number and concentration of factory farms in the United States continues to increase.

Key Findings

Between 1997 and 2012, there was an economic and geographic shift in how and where food animals are raised in the United States. Even just a few decades ago, small- and medium-sized dairy, cattle and hog farms were dispersed across the country. Today, these operations are disappearing. The remaining operations are primarily large-scale factory farms that are concentrated in specific regions, states and even counties, where thousands of animals on each farm can produce more sewage than most large cities, overwhelming the capacity of rural communities to cope with the environmental and public health burdens.

Food & Water Watch analyzed U.S. Department of Agriculture (USDA) *Census of Agriculture* data from 1997, 2002, 2007 and 2012 for beef cattle, hogs, dairy cattle, broiler meat chickens and egg-laying operations.¹ In this report, and in our accompanying online map (www.factoryfarmmap.org), we define factory farms as operations with more than 500 beef cattle (feedlots only), 1,000 hogs, 500 dairy cows, 100,000 egg-laying chickens and 500,000 broiler chickens (sold annually), the largest size categories that the USDA recognizes in its survey. (See the methodology in the appendix for a more detailed description of Food & Water Watch's data analysis.)

Key findings from Food & Water Watch's analysis include:

- **The total number of livestock on the largest factory farms rose by 20 percent between 2002 and 2012.** The number of livestock units on factory farms increased from 23.7 million in 2002 to 28.5 million in 2012.² "Livestock units" is a way to measure different kinds of animals on the same scale based on their weight — one beef cattle is the equivalent of approximately two-thirds of a dairy cow, eight hogs or four hundred chickens.³



- **These factory-farmed livestock produced 369 million tons of manure in 2012**, about 13 times as much as the sewage produced by the entire U.S. population. This 13.8 billion cubic feet of manure is enough to fill the Dallas Cowboys stadium 133 times.⁴ Unlike sewage produced in cities, the manure on factory farms does not undergo any wastewater treatment.
- **The number of dairy cows on factory farms doubled, and the average-sized dairy factory farm increased by half, between 1997 and 2012.** The number of dairy cows on factory farms rose 120.9 percent from 2.5 million cows in 1997 to 5.6 million in 2012, the equivalent of adding 550 factory-farmed dairy cows every day for 15 years. The average size of dairy factory farms grew by half (49.1 percent), from 1,114 cows in 1997 to 1,661 in 2012. In nine states — Kansas, Oklahoma, New Mexico, Arizona, Idaho, Texas, Indiana, Missouri and Nevada — the average size was more than 2,000 cows in 2012.
- **The number of beef cattle on feedlots rose 5 percent from 2002 to 2012. Feedlot size grew even as the 2012 drought reduced total cattle numbers.** The number of beef cattle on operations with at least 500 head grew from 11.6 million in 2002 to 12.1 million in 2012 — adding about 157 beef cattle every day for 10 years.⁵ Texas, Nebraska and Kansas all had more than 2 million beef cattle on feedlots in 2012. The 2012 drought reduced the total number of beef cattle on feedlots nationwide, but the average feedlot size increased by 13.7 percent over five years, from 3,800 in 2007 to more than 4,300 in 2012.
- **The number of hogs on factory farms increased by more than one-third, and the average farm size swelled nearly 70 percent from 1997 to 2012.** The number of hogs on factory farms grew by 37.1 percent — from 46.1 million in 1997 to 63.2 million in 2012 — the equivalent of adding 3,100 hogs to factory farms every day for the past 15 years. The average size of a hog factory farm increased 68.4 percent, from 3,600 hogs in 1997 to nearly 6,100 in 2012.
- **The number of broiler chickens on factory farms rose nearly 80 percent from 1997 to 2012, to more than 1 billion.** The number of broiler chickens raised on factory farms rose 79.9 percent from 583.3 million in 1997 to 1.05 billion in 2012 — about three birds for every person in the United States.⁶ The growth in industrial broiler production added 85,000 chickens to factory farms every day over the past 15 years. The average size of U.S. broiler chicken operations rose by 5.9 percent, from 157,000 in 1997 to 166,000 birds in 2012. The average size in California and Nebraska exceeded 500,000 birds in 2012.
- **The number of egg-laying hens on factory farms increased by nearly one quarter from 1997 to 2012, to 269 million.** The number of egg-producing layer hens increased 24.8 percent, from 215.7 million in 1997 to 269.3 million in 2012. Nearly half (49.3 percent) of the egg-laying hens in 2012 were in the top-five egg-producing states: Iowa, Ohio, Indiana, California and Texas. The average size of egg operations has grown by 74.2 percent over 15 years, rising from 399,000 in 1997 to more than 695,000 in 2012.

The incredible growth of factory farming is due to three key factors. First, unchecked mergers and acquisitions between the largest meatpacking, poultry processing and dairy companies created an intensely consolidated landscape where a few giant agribusinesses exert tremendous pressure on livestock producers to become larger and more intensive. Second, lax environmental rules and lackluster enforcement allowed factory farms to grow to extraordinary sizes without having to properly manage the overwhelming amount of manure they create. And finally, for much of the past 15 years, misguided farm policy encouraged over-production of commodity crops such as corn and soybeans, which artificially depressed the price of livestock feed and created an indirect subsidy to factory farm operations. Although crop prices rose in recent years, in 2014 the USDA projected that prices would decline for several years, and the pace of factory farm construction has increased to take advantage of expected cheaper feed prices in coming years.

The combination of these trends has eroded rural economies, driven independent producers out of business and allowed the largest livestock operations to dominate animal agriculture in the United States. The manure from these factory farm operations pollutes the environment and endangers public health. Crowded conditions leave animals susceptible to disease, drive the overuse of antibiotics and can mean that food safety problems on even a few factory farms can end up in everyone's refrigerator.

The stakes are high for the future of livestock production. Because government at all levels has made decisions that

contributed to the rise of factory farms, all levels of government must be involved in changing policies and enforcing existing laws to rein in this industry.

Food & Water Watch recommends:

- The U.S. Environmental Protection Agency (EPA) and states should establish a moratorium on the construction of new factory farms and on the expansion of existing facilities.
- The EPA must implement and enforce appropriate environmental rules to prevent factory farm pollution.
- The Department of Justice must prevent the continued consolidation of the meatpacking and poultry, egg and dairy processing industries and revisit the mergers that it already has approved to ensure that farmers get fair prices for their livestock.
- Congress must restore sensible commodity programs that do not prioritize the production of artificially cheap livestock feed over fair prices to crop farmers.
- The Food and Drug Administration (FDA) must prohibit non-therapeutic use of antibiotics and other livestock treatments that facilitate factory farming at the expense of public health.
- The USDA must enforce and strengthen livestock marketing and contract regulations to allow independent livestock producers access to fair markets.
- State environmental authorities must step up their permitting and enforcement of water and air pollution regulations on factory farms.

Introduction

The significant growth in industrial-scale, factory-farmed livestock has contributed to a host of environmental, public health, economic, food safety and animal welfare problems. Thousands of animals in one location can generate millions of tons of manure annually, which pollutes water and air and can have health repercussions for neighbors and nearby communities. Consumers in distant markets also feel the impacts, through either foodborne illness outbreaks, other public health risks or the loss of regional food systems. Even most producers are not benefiting from this system of production because they are not getting paid much for the livestock that they raise.

The rise of factory farming was no accident. It resulted from public policy choices driven by big agribusinesses, especially meatpackers and processors that dominate the critical steps in the food chain between livestock producers and consumers. The silos and gentle meadows pictured on the labels of the food that most Americans buy have little relation to how that food is actually produced. Most of the pork, beef, poultry, dairy and eggs produced in the United States come from large-scale, confined livestock operations.

These animals produce tremendous amounts of manure. Food & Water Watch estimates that the livestock and poultry on the largest factory farms in 2012 produced 369 million tons of manure — almost 13 times more than the 312 million people in the United States.⁷ This 13.8 billion



cubic feet of manure is enough to fill the Dallas Cowboys stadium 133 times.⁸ Unlike the household waste produced in an overwhelming majority of U.S. communities, which have municipal sewer systems, the manure and waste from livestock operations is untreated. Instead, factory farm waste is stored in manure pits or lagoons, and ultimately it is applied to farm fields as fertilizer. As the *Wisconsin State Journal* noted, “[u]nlike cities, which treat their waste, most of the large farms dispose of manure the same way farmers disposed of it in the Middle Ages — by spreading it on fields as fertilizer.”⁹

Small, diversified farms that raise animals as well as other crops have always used manure as fertilizer without polluting water. The difference with factory farms is scale. They produce so much waste in one place that it must be applied to land in quantities that exceed the soil’s ability to incorporate it. The vast quantities of manure can — and do — make their way into the local environment, where they pollute air and water. Manure contains nitrogen, phosphorus and often bacteria that can impact the environment and human health. Manure lagoons leak, and farmers over-apply manure to their fields, which allows the waste to seep into local streams and groundwater. Residential drinking wells can be contaminated with dangerous bacteria that can sicken neighbors, and the runoff can damage the ecological balance of streams and rivers. In some cases, manure spills that reach waterways can kill aquatic life.

Large quantities of decomposing manure don’t just stink, they can be a health hazard as well. Noxious gas emissions from manure holding tanks and lagoons — including hydrogen sulfide, ammonia and methane — can cause skin rashes, breathing problems, and headaches, and long-term exposure can lead to neurological problems. For children, senior citizens and adults with other health problems, exposure to these fumes can cause even more problems.

Industrial livestock operations also can create public health hazards in other ways. The facilities are overcrowded and stressful to animals, making it easy for disease to spread. When thousands of beef cattle are packed into feedlots full of manure, bacteria can get on their hides and then into slaughterhouses. Contamination on even one steer can contaminate thousands of pounds of meat inside a slaughterhouse. In 2010, the crowded, unsanitary conditions at two Iowa egg companies caused a recall of more than half a billion potentially *Salmonella*-tainted eggs and was linked to illness in nearly 1,500 people.¹⁰



Factory farms can create public health concerns beyond foodborne illness. Because over-crowded animals are susceptible to infection and disease, most industrial livestock facilities treat the animals with low levels of antibiotics to try to prevent illness and compensate for stressful conditions. By creating an ideal breeding ground for antibiotic-resistant bacteria, the overuse of antibiotics on factory farms can reduce the effectiveness of antibiotics for human patients. The feed used for livestock can also introduce public health threats. For decades, broiler chickens received arsenic-based feed additives to promote pinker flesh and faster growth, and beef cattle continue to be fed with animal byproducts, which increases the risk of mad cow disease.

These unhealthy conditions and additives not only pose threats to the environment and public health, they also are detrimental to the animals themselves. Most factory-farmed hogs and chickens have no access to the outdoors and never see daylight. Beef cattle and dairy cows spend time outside, but they are crammed onto feedlots with no access to pasture or grass. The lack of outdoor access, inability to express natural behaviors or graze, health problems and stress caused by production practices, and breeding designed to maximize weight gain or egg and milk production take a toll on animal welfare.

Nor have most farmers benefited from the shift to factory farming. The number of dairy, hog and beef cattle producers in America has declined sharply over the last 20 years as the meatpacking, processing and dairy industries have driven farmers to increase in scale. Most farmers

barely break even. In 2012, more than half of farmers lost money on their farming operations.¹¹ The tiny handful of companies that dominates each livestock sector exerts tremendous control over the prices that farmers receive, and these companies micromanage the day-to-day operations of many farms. The real price that farmers receive for livestock has trended steadily downward for the last two decades.

The rapid transformation of livestock production from hundreds of thousands of independent farmers with reasonably sized operations to a few thousand mega-farms did not happen naturally. Factory farming was facilitated by three policy changes pushed by the largest agribusinesses: 1) Farm Bills from the mid-1990s through mid-2000s artificially lowered the cost of crops destined for livestock feed, 2) the EPA ignored factory farm pollution and 3) the Department of Justice allowed the largest meatpackers to merge into a virtual monopoly.

Since the 1980s, U.S. farm policy has encouraged the overproduction of corn, soybeans and other crops used for livestock feed. For most of the past quarter century, this overproduction made the cost of feed artificially low — below the cost it took to raise the crops. Permitting crop prices to fall below their cost of production and then paying farmers some of the difference with taxpayer dollars indirectly subsidizes factory farms, meatpackers and food processors. Artificially low commodity prices encouraged livestock producers to buy feed rather than pasture their livestock or grow their own feed crops. Since producers no longer needed land for pasture or feed crops, and feed costs were low, it became economically feasible to confine large numbers of animals together in factory farm facilities without an enormous amount of land.

Crop prices rose in 2008 when bad weather coincided with increased demand from overseas consumers and biofuel plants that absorbed more of U.S. crop production.¹² Wall Street investment banks accelerated the price increases and volatility as speculators increasingly viewed farm production as an asset class.¹³ Prices generally remained high, but volatile, between 2008 and 2012.¹⁴ By 2014, crop prices began to fall again and were projected to remain lower for the foreseeable future.¹⁵ The forecast of a long-term, low-priced feed environment has encouraged a resurgence of factory farm construction for hogs and broiler chickens.¹⁶

The environmental oversight of factory farms is disjointed, toothless and almost non-existent. Weak oversight of waste disposal, a major expense in livestock operations,

reduces the costs of factory farming and encourages the development of larger operations. Although the EPA is tasked with regulating factory farms, it has done little to nothing to control the environmental damage caused by factory farms. Attempts to require adequate oversight have been blocked repeatedly by the livestock industry, which has opposed any safeguards or oversight of factory farm pollutants.

While these two policies reduced the major operating costs of factory farming — feed and manure disposal — the growing trend toward consolidation within the meat-packing, poultry and dairy industries cemented factory farming as the dominant model of livestock production. Over the past two decades, a wave of mergers and acquisitions has concentrated the livestock sectors into the hands of just a few dominant companies. These power-houses employ heavy-handed tactics, abusive contract terms and manipulative practices that minimize the prices they pay for livestock. In many cases, the companies encourage or require farmers to increase the scale of their operations, or the companies will not buy their livestock at all.

The result of these trends converging is clear: most animals raised for food in the United States are raised on factory farms, and, over the past decade, factory farms have become bigger and more concentrated in certain regions of the country.

Dairy

In recent years, small and mid-sized dairy farms have been disappearing and are being replaced by dairy factory farms that now dominate milk production. Between 1997 and 2012, the United States lost nearly half its dairy farms (52,750 farms, or about 3,500 farms per year on average), but because the remaining farms added more cows, total milk production has actually increased by nearly a third.¹⁷

Consolidation in the dairy processing industry has driven both the loss of farms and the rise of dairy factory farms. Up until the 1990s, medium-sized fluid milk processors were local businesses that bought milk from local dairy farms and supplied local consumers and retailers.¹⁸ Now, a handful of companies buys the majority of milk, increasingly from industrial mega-dairy farms, and processes it into dairy products and processed food ingredients. The largest milk processing company, Dean Foods, controls over a third (36 percent) of the nation's fluid milk supply.¹⁹ While Dean Foods is the most common source of milk in the dairy case, consumers might not see a Dean label

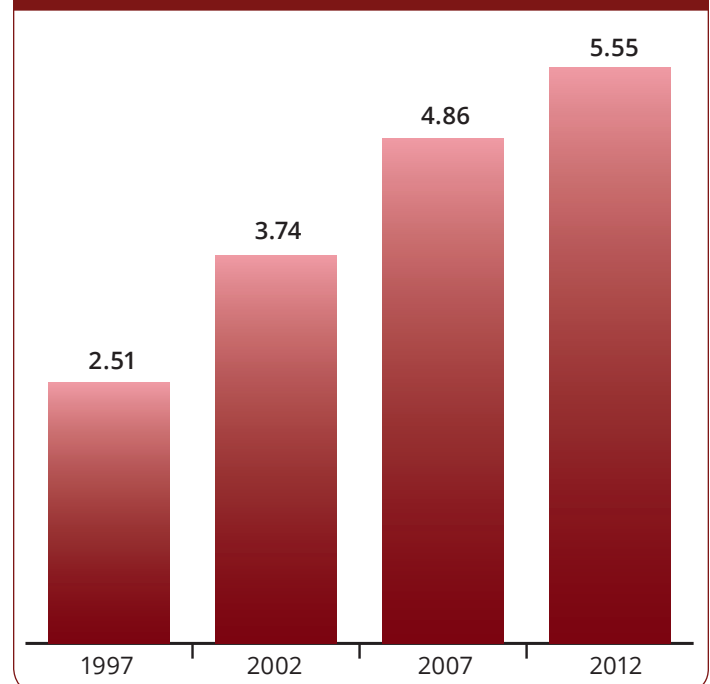
because the milk is marketed under more than 55 regional brands, including Garelick, Alta Dena and Fieldcrest.²⁰ Consumers at the dairy case see familiar labels that they have long associated with local or regional companies, but the company behind many of the labels is Dean.

Increasing Size

Food & Water Watch's analysis of the USDA *Census of Agriculture* data found that the number of cows on factory farms with over 500 head more than doubled from 2.5 million in 1997 to 5.5 million in 2012.²¹ (See Figure 1.) About 3.0 million dairy cows were added to factory farm operations over 15 years — about 555 additional cows every day.

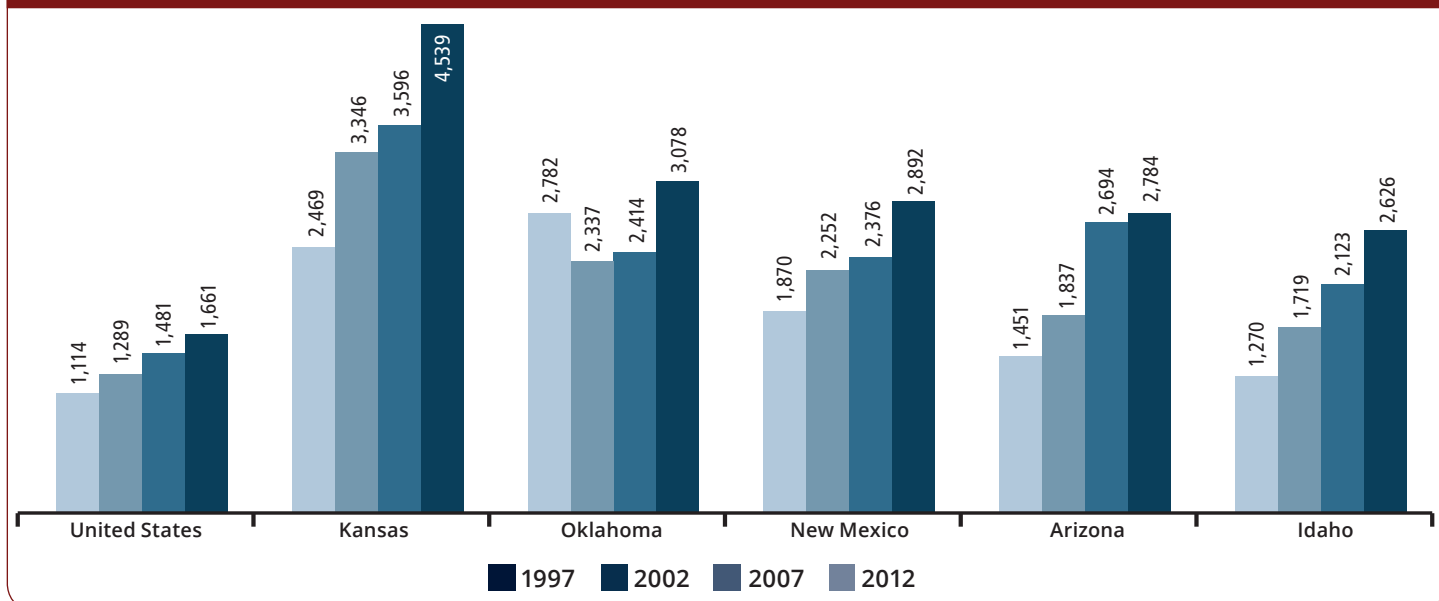
The rise of the factory farm dairy industry has been more pronounced in western states and has transformed the national dairy landscape over the past decade. Food & Water Watch found that although traditional dairy states like Wisconsin and New York added more than 550,000 dairy cows to their largest operations over 15 years, these states were outpaced by the size and growth of dairy factory farms in western states. In 2012, there were more than 2.9 million cows on dairy factory farms in California, Idaho, Texas and New Mexico. The emergence of western dairy factory farms has contributed to the decline of local dairy farms in the Southeast, Northeast, Upper Midwest and parts of the Midwest.

Figure 1 • Number of Dairy Cows on Factory Farms (in millions)



SOURCE: FOOD & WATER WATCH ANALYSIS OF USDA DATA.

Figure 2 • Average Size of Dairy Factory Farms



SOURCE: FOOD & WATER WATCH ANALYSIS OF USDA DATA.

Food & Water Watch found that the average size of dairy factory farms increased by half over the decade, rising from 1,114 head in 1997 to 1,661 head in 2012. Many states have higher average-sized dairy factory farms. The average-sized dairy factory farms in Kansas, Oklahoma, New Mexico, Arizona and Idaho contained more than 2,500 cows. (See Figure 2.)

Manure Overload

Small dairy farms generate less manure than factory farms; they usually apply that manure to cropland, or

it is incorporated into pasture as cows graze. Because big dairies generate far more manure than they can use as fertilizer, they must either store it in giant lagoons or apply it to cropland at excessive rates, where it can leach into groundwater and run off into nearby rivers and streams.

The largest dairy factory farm counties produce as much untreated dairy waste as the sewage produced in major American metropolitan areas (which goes to wastewater treatment plants). (See Table 1.) The more than 485,000 dairy cows on dairy factory farms in Tulare County, Cali-

TABLE 1 • Top Dairy Factory Farm Counties and Human Sewage Equivalent

Top Dairy Factory Farm Counties	Dairy Cows on Factory Farms	Human Population Sewage Equivalent (millions)	Comparable Metropolitan Area
California/Tulare	485,938	107.6	5 x New York City
California/Merced	268,656	59.5	10 x Philadelphia
Idaho/Gooding	173,870	38.5	10 x Seattle
California/Stanislaus	165,740	36.7	Chicago + Dallas + Washington, DC + Miami + Atlanta + Minneapolis-St. Paul
California/Kings	165,623	36.7	New York City + Los Angeles + San Diego
California/Kern	128,302	28.4	10 x Tampa-St. Petersburg
California/Fresno	109,195	24.2	10 x Pittsburgh
Arizona/Maricopa	107,537	23.8	10 x Charlotte, NC
California/San Joaquin	104,298	23.1	New York City + San Diego
Washington/Yakima	97,718	21.6	6 x Seattle
California/San Bernardino	82,031	18.2	3 x Philadelphia
New Mexico/Chaves	75,941	16.8	Los Angeles + San Diego

NOTE: comparison is to the population of the entire greater metropolitan area, not only the city population.

California produce five times as much waste as the population in the greater New York City metropolitan area.²² The nearly 268,000 dairy cows in Merced County, California produce about 10 times as much waste as the population of the entire metropolitan area of Philadelphia.

Beef

Over the past decade, large-scale industrial feedlots that fatten beef cattle prior to slaughter came to dominate the entire cattle industry. These feedlots buy from small or mid-sized ranches that raise young cattle and then “finish” cattle to market weight. Even in 2012, nearly half (46 percent) of all beef cattle were raised on 665,000 farms and ranches with fewer than 100 head of cows.²³ But most of these cattle ultimately end up on feedlots before they go to the slaughterhouse.

These feedlots have gotten much larger and often partner with or are owned by meatpackers. Until the mid-1960s, most feedlots were small, family-owned operations that handled fewer than 1,000 head. They marketed most of the nation’s beef cattle.²⁴ Now, the largest beef feedlots finish the vast majority of beef cattle. In 2012, the largest 607 feedlots (1.8 percent) each finished more than 32,000 cattle and marketed more than three quarters (76.5 percent) of beef cattle.²⁵

Increasing Size

Food & Water Watch found that the number of beef cattle on feedlots larger than 500 head grew by 5.0 percent — from more than 11.5 million in 2002 to 12.1 million in 2012 — adding about 157 beef cattle every day for 10 years.²⁶ (See Table 2.) Cattle on the largest feedlots declined from 2007 to 2012 because persistent drought and high feed prices reduced the number of cattle and forced some

TABLE 2 • Top Factory Farm Feedlot Inventory

State	2002	2007	2012
	Head of Cattle		
Texas	2,644,450	2,993,215	2,738,120
Nebraska	2,173,979	2,512,659	2,481,426
Kansas	2,223,850	2,566,734	2,180,082
Colorado	1,062,357	1,102,792	992,007
Iowa	606,648	1,178,958	953,728
United States	11,555,300	13,528,205	12,130,113

feedlots to close.²⁷ Nonetheless, five states with the largest inventories of beef cattle on the biggest feedlots all had more than 950,000 factory-farmed beef cattle. Combined, these five states (Texas, Nebraska, Kansas, Colorado and Iowa) held 9.3 million head of beef cattle on feedlots in 2012 — more than three fourths (77.0 percent) of all factory-farmed beef cattle in the country.

The national average for beef feedlot size was over 4,300 head in 2012, 13.7 percent higher than 2007 despite the drought and high feed prices. In many states, the average feedlot size increased significantly, and in five states (Arizona, California, Texas, Washington and Oklahoma), the average feedlot size was larger than 18,000 head, triple the national average.

Most cattle feedlots are located in rural counties, but the large number of cattle in these areas produces the same amount of waste as some of America’s largest cities. The manure from cattle feedlots is stored on site until it is

TABLE 3 • Top Factory Farmed Beef Feedlot Counties and Human Sewage Equivalent

Top Factory Farm Beef Feedlot Counties	Beef Cattle on Feedlots	Human Population Sewage Equivalent (millions)	Comparable Metropolitan Area
California/Imperial	340,548	34.3	2 x Los Angeles + San Francisco-Oakland + Sacramento
Kansas/Haskell	330,882	33.3	10 x St. Louis + 2 x Kansas City
Texas/Deaf Smith	328,196	33.0	3 x Dallas + 2 x Houston
Texas/Castro	292,440	29.4	2 x Dallas + 2 x Houston + San Antonio
Nebraska/Cuming	248,710	25.0	28 x Omaha
Colorado/Weld	243,345	24.5	9 x Denver
Iowa/Sioux	240,469	24.2	40 x Des Moines
Texas/Parmer	219,040	22.1	3 x Houston + 2 x Austin
Texas/Hartley	216,215	21.8	4 x San Antonio + Dallas + Houston
Texas/Hansford	209,947	21.1	3 x Houston + San Antonio

spread on to nearby farm fields. But feedlots can flood or generate polluted runoff, and over-applied manure on farm fields can leach into groundwater or run off into nearby waterways. The more than 340,500 beef cattle on feedlots in Imperial County, California produce as much manure as the human sewage output of twice the greater metro-

politan Los Angeles area plus San Francisco–Oakland and Sacramento.²⁸ The nearly 331,000 beef cattle on feedlots in Haskell County, Kansas produce twice as much waste as 10 St. Louis metropolitan areas and two Kansas City metro areas combined.

Packers v. Cowboys: How Meatpackers Manipulate Cattle Markets

The beef packing industry is more powerful and consolidated now than it was a century ago when Congress enacted the Packers and Stockyards Act to break up the beef monopolies.²⁹ Beef packing is the most concentrated industry in the livestock sector. Feedlots are getting larger in order to sell into an increasingly consolidated meatpacking industry, with just four firms slaughtering more than four out of five beef cattle.³⁰ This concentration gives large packers tremendous leverage over independent cattle producers. The pressure to sell to larger meatpackers has encouraged independently owned feedlots to get bigger, in part to compete with large meatpacker-owned feedlots.

The large beef packers now own their own cattle and operate feedlots, thus controlling supply through multiple stages of production and reducing their need to buy cattle from independent and small operators. More than 1 out of 20 cattle (5.6 percent) slaughtered in 2012 were packer-owned.³¹ Packer-owned feedlots enable the meatpackers to drive down cattle prices, keep consumer beef prices high and push down the prices paid to producers. Because meatpackers who own cattle can be sellers, buyers or on both sides of a sale, they can distort or manipulate prices. They can slaughter their own cattle when the cash price is high or buy at auction when prices are low, which can drive down prices for other independent cattle producers.³² It also effectively reduces the options for independent producers to market their cattle because 1 out of 20 cattle never go to auction.

Company-owned feedlots can be immense. The world's largest beef processor, JBS, owns the Five Rivers Cattle Feeding company, which in 2012 had a capacity of 930,000 head on 12 feedlots in Arizona, Colorado, Idaho, Kansas, Oklahoma, Texas and Alberta, Canada.³³ The average Five River feedlot has about 77,500-head capacity, but the largest in Wellton, Arizona had a capacity of 120,000.³⁴ In 2012, Cargill's cattle feedlot business was the third largest in the United States, feeding more than 350,000 head of cattle.³⁵ In 2015, Cargill operated two feedlots in Texas, one in Kansas and one in Colorado.³⁶

These corporate-owned feedlots are generally bigger than independently owned feedlots, and they lack roots in their local communities. Cargill is headquartered in Minnesota, but its feedlots are located in Texas, Colorado and Kansas. JBS is a Brazilian company. While farmers and ranchers drink the same water and breathe the same air as their neighbors, the corporate owners of these largest feedlots are located thousands of miles from any environmental problems they may create.



Pork

Hog farms have grown dramatically, with thousands of hogs packed into confinement barns. In many regions, there are only one or two pork packers, so hog producers have few potential buyers for their hogs. This economic pressure has led many hog producers to follow the meat industry's mantra to "get big or get out."³⁷ In less than two decades, the number of hog farms declined by 70 percent, from more than 240,000 in 1992 to fewer than 70,000 in 2007.³⁸ The number of farms continued to drop to under 56,000 farms in 2012.³⁹

Despite the collapse in the number of farms, the number of hogs grew as the scale of the remaining operations exploded. (See Figure 3.) What makes the rise of factory farms in the hog industry so noteworthy is that it happened recently and quickly. In 1992, less than a third of hogs were raised on farms with more than 2,000 animals.⁴⁰ By 2012, 97.4 percent of hogs were raised on operations with more than 2,000 hogs.⁴¹ (See Figure 4.)

The decline in the number of farms and the explosion in the size of hog operations was driven by consolidation in the pork packing and processing industry. Since the 1990s, a wave of mergers has significantly increased consolidation in the pork packing industry. In 1995, the top four pork packers slaughtered less than half of the hogs (46 percent), but by 2012 the top four firms slaughtered nearly two thirds of the hogs.⁴² These companies pressed farmers

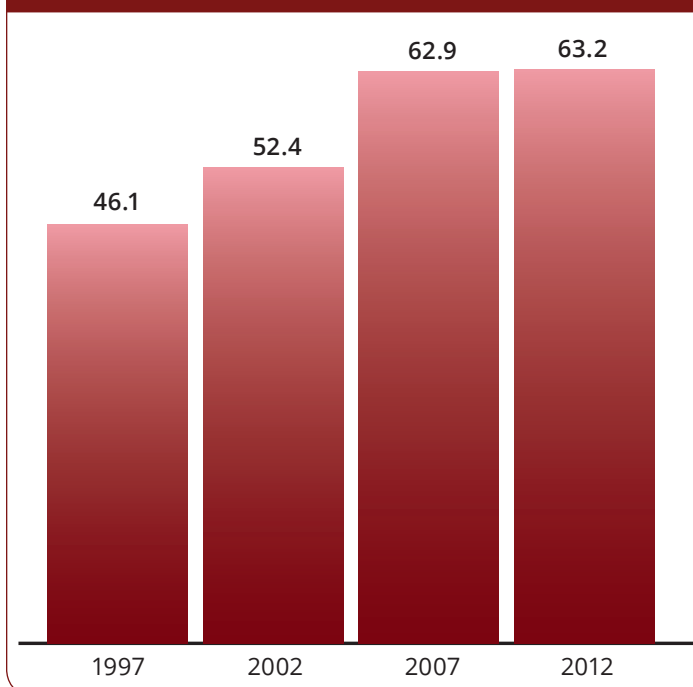
to enter into contracts to raise hogs owned by the packers or to commit to selling to a specific packer long before the hogs are ready to be slaughtered.

In 1993, almost all hogs (87 percent) were sold at auction to pork packers or processors. By 2013, nearly all (93 percent) hogs were controlled well before the time of slaughter by the pork packers, either because they owned the hogs (29 percent) or because they already had contracted to buy the hogs (64 percent).⁴³ The use of these contract arrangements depresses the price of hogs. Average hog prices were \$81 per hundredweight between 1989 and 1993 (in 2014 dollars), when most hogs were not under contract. During the 2010 to 2014 period, average hog prices were \$68 per hundredweight, nearly 20 percent less.⁴⁴

Increasing Size

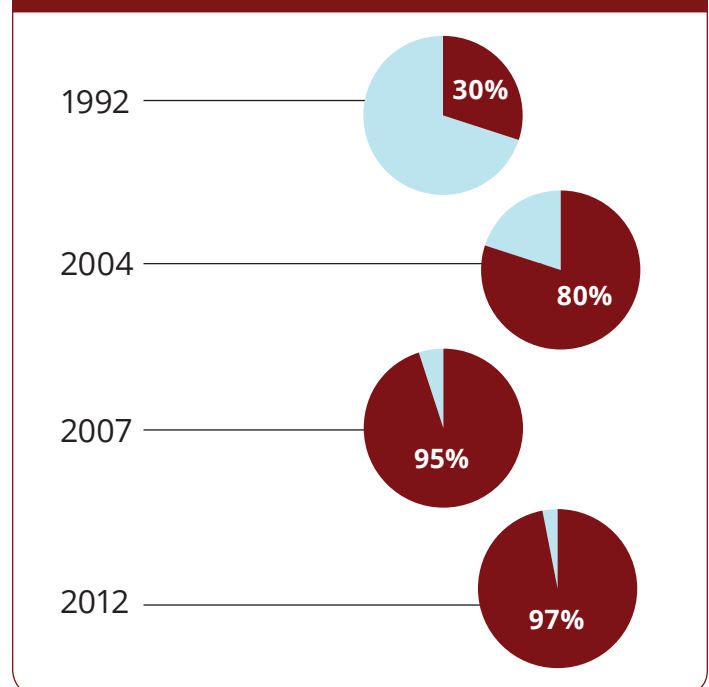
Food & Water Watch found that the number of hogs on factory farms with more than 1,000 head grew by more than a third (37.1 percent), from 46.1 million in 1997 to 63.2 million in 2012, although the growth slowed as feed prices increased after 2008. (See Figure 3.) The addition of 17.1 million hogs over 15 years put 3,100 more hogs onto factory farms *every day*. The decline in feed prices after 2012 has encouraged a resurgence in hog factory farm construction. During 2013 and 2014, Iowa farmers have applied to build 700 new hog facilities, six times the level

Figure 3 • Number of Hogs on U.S. Factory Farms (in millions)



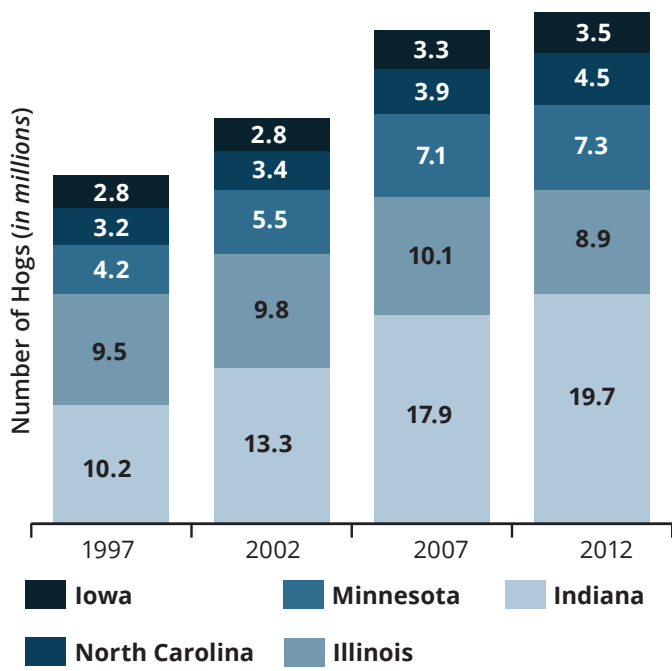
SOURCE: FOOD & WATER WATCH ANALYSIS OF USDA DATA.

Figure 4 • Share of Hogs on Operations Larger Than 2,000 Head



SOURCE: USDA.

Figure 5 • Top Factory Farm Hog States

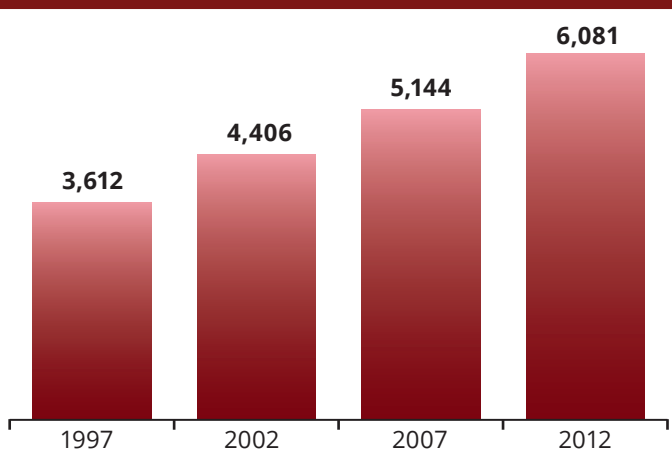


five years earlier when feed was more expensive, and other Midwestern states have seen similar hog factory farm building booms.⁴⁵

The five largest states for factory-farmed hogs (Iowa, North Carolina, Minnesota, Illinois and Indiana) represent about 70 percent of all factory-farmed hogs. (See Figure 5.) They have held this ranking since 1997, but the most rapid growth has been in the Midwest. The number of hogs on factory farms in Iowa nearly doubled (a 93 percent increase) between 1997 and 2012, and in Minnesota, the number surged 76 percent. In contrast, although North Carolina has maintained the second-place ranking for the number of factory-farmed hogs, this number has fallen from its peak of 10 million in 2007, and now there are fewer factory farmed hogs in the state than in 1997, in part due to state laws limiting the construction of new manure systems.⁴⁶

Food & Water Watch found that the average hog factory farm size increased by 68.4 percent over a decade, rising from 3,612 hogs per farm in 1997 to 6,081 in 2012. (See Figure 6.) The largest hog factory farms were not in the states with the largest number of hogs, but in states where hog production was limited largely to a few counties with enormous operations. Eight states averaged more than 10,000 hogs per factory farm, and Utah factory hog farms had more than 65,000 hogs — 10 times the national average.

Figure 6 • Average Size of U.S. Factory Hog Farms



Manure Overload

Much of U.S. hog production is concentrated in the grain- and soybean-producing Midwest. The tremendous amount of manure produced on hog factory farms is stored in lagoons and applied — often over-applied — to cropland. In the upper Midwest, where farmland freezes solid during the winter, manure applied to frozen fields

SOURCE - FIGURES 5 AND 6: FOOD & WATER WATCH ANALYSIS OF USDA DATA.

TABLE 4 • Top Factory Farm Hog Counties and Human Sewage Equivalent

Top Factory Farm Hog Counties	Hog Inventory	Human Population Sewage Equivalent (millions)	Comparable Metropolitan Area
North Carolina/Sampson	1,854,471	32.3	14 x Charlotte
North Carolina/Duplin	1,725,305	30.1	25 x Raleigh
Oklahoma/Texas	1,204,135	21.0	3 x Dallas
Iowa/Sioux	1,134,262	19.8	33 x Des Moines
Iowa/Washington	972,291	17.0	65 x Cedar Rapids
Minnesota/Martin	797,305	13.9	4 x Minneapolis-St. Paul
Iowa/Plymouth	722,227	12.6	21 x Des Moines
Iowa/Hardin	714,373	12.5	Chicago + St. Louis
Iowa/Lyon	698,205	12.2	14 x Omaha
North Carolina/Bladen	650,537	11.3	5 x Charlotte

cannot be absorbed, so it runs off into local waters. When manure storage lagoons spill or leak, or if manure is over-applied on farmland, it easily can end up in local waterways.

In 2012, eighteen U.S. counties held more than half a million hogs on factory farms. These counties effectively generated the same amount of untreated manure as the volume of sewage that enters the wastewater treatment plants of some of America’s largest cities. The more than 1.8 million hogs in Sampson County, North Carolina generated 14 times as much waste as the entire Charlotte metropolitan area, and the million-plus hogs in Sioux County, Iowa produced 33 times as much waste as Des Moines.⁴⁷

Chicken

Chicken meat comes from billions of chickens raised on thousands of broiler chicken operations, where farmers raise birds on contract for the few poultry processing companies that dominate the industry. This means that the companies own the chickens and pay farmers to raise them. Under these contracts, the companies make management decisions such as feed and chick delivery scheduling, and they lock farmers into contracts that prohibit the farmers from selling chickens to anyone else. The scale of chicken farms has grown rapidly, as growers

try to eke out a living by increasing the volume of birds they produce on contract. The median-sized chicken operation increased by 21 percent in a decade, rising from 520,000 birds annually in 2002 to 628,000 birds in 2011.⁴⁸

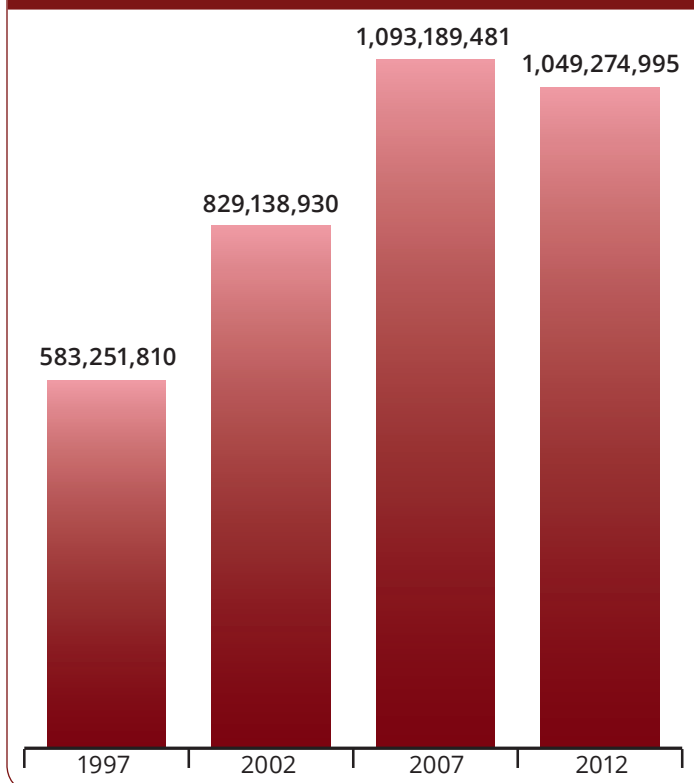
Increasing Size

Food & Water Watch found that in 2012, there were over 1 billion broiler chickens on large farms in the United States at any one time — more than three birds for each person in the country.⁴⁹ The number of broiler chickens increased by 79.9 percent over 15 years, rising from 583.3 million in 1997 to 1.05 billion in 2012, adding about 3,500 chickens every hour. (See Figure 7.) The number of broiler chickens declined slightly (by 4.0 percent) from 2007 to 2012 as a result of higher feed prices.⁵⁰ As feed prices subsequently moderated and began to fall, more new chicken houses were being built in poultry regions like the Eastern Shore of the Chesapeake Bay.⁵¹

Broiler production is concentrated largely in Southeastern states and is even more concentrated within states into localized clusters.⁵² In 2012, more than half of broilers were raised in Georgia, Arkansas, Alabama, Mississippi and Texas. (See Table 5.) In Arkansas, Mississippi and Texas, the number of broilers nearly doubled between 1997 and 2012. The concentration of broiler operations means that 21 states have no large-scale broiler production at all.

The average size of U.S. broiler operations rose from about 156,000 chickens in 1997 and 2002 to about 166,000 chickens in 2007 and 2012. These figures represent the average number of birds housed in facilities at any one time. Over the course of a year, 911,000 broilers would have passed through the average operation in 2012, in five-and-a-half flocks that each stayed on the farm for roughly seven weeks. In the states with the largest opera-

Figure 7 • Broiler Chickens on Factory Farms



SOURCE: FOOD & WATER WATCH ANALYSIS OF USDA DATA.

TABLE 5 • Top Broiler Factory Farm States

State	1997	2002	2007	2012
	Inventory in Millions of Chickens			
Georgia	111.5	148.8	204.9	170.9
Arkansas	58.8	84.2	133.8	116.3
Alabama	68.3	99.5	107.6	110.1
Mississippi	51.8	75.4	110.3	102.4
Texas	46.7	77.9	90.4	92.8
United States	583.3	829.1	1,093.2	1,048.9

tions, these operations are considerably larger than the national average — four states averaged broiler flocks in excess of 200,000 birds at any one time.⁵³ (See Figure 8.) In 2012, the average broiler operation inventory in California exceeded 1.7 million birds.

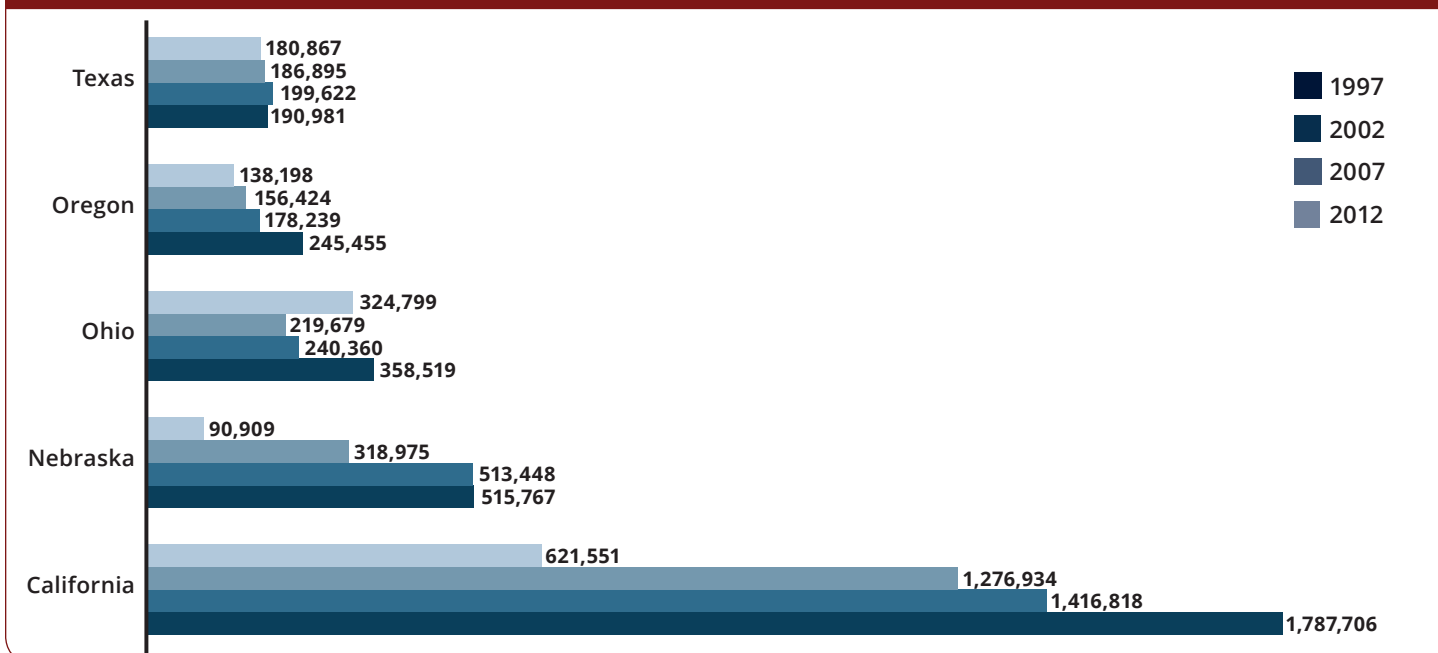
Litter Overload

Although the poultry companies own the chickens and the feed that goes into them, the contract farmers are responsible for the management of the manure. Poultry litter — chicken manure and manure-laden bedding (usually rice hulls or straw) — is stored on farms, where it is applied to farmland as fertilizer. In many dense poultry-production areas, the volume of poultry litter greatly exceeds the

fertilizer need and capacity of nearby farmland. With so many birds and so much manure, the accumulated litter can pose a significant environmental risk.

Even though chickens are small and produce less manure than cattle or hogs, the sheer number of broilers in many rural counties produces as much untreated manure as the sewage output of some major and mid-sized metropolitan areas. (See Table 6.) The more than 18 million broiler chickens on factory farms in Shelby County, Texas produce about as much waste as the population of the entire Dallas-Fort Worth metropolitan area. The 17.8 million broilers in Fresno County, California produce six times as much waste as the population of the Fresno metro area.

Figure 8 • Average Broiler Factory Farm Size in States with Largest Operations



SOURCE: FOOD & WATER WATCH ANALYSIS OF USDA DATA.

TABLE 6 • Top Factory Farm Broiler Counties and Human Sewage Equivalent

Top Factory Farm Broiler Counties	Number of Chickens	Human Population Sewage Equivalent (millions)	Comparable Metropolitan Area
Texas/Shelby	18,907,120	6.4	Dallas
California/Fresno	17,877,062	6.0	6 x Fresno
Arkansas/Benton	16,958,946	5.7	8 x Little Rock
Texas/Nacogdoches	14,323,576	4.8	2 x San Antonio
Georgia/Franklin	13,436,316	4.5	2 x Charlotte
Missouri/Barry	12,164,827	4.1	2 x Kansas City
Delaware/Sussex	11,744,313	3.9	Baltimore + Wilmington
Virginia/Rockingham	11,553,334	3.9	3 x Richmond
Arkansas/Washington	11,258,460	3.8	5 x Little Rock
Mississippi/Smith	10,729,243	3.6	6 x Jackson, MS

Contract Abuse

The broiler industry is the most “vertically integrated” segment in agriculture — a system where companies own and control every step of the supply chain. Over the past 20 years, as larger companies acquired smaller, regional processors and cooperatives, it has become increasingly concentrated. Over the past 30 years, the market share of the top four poultry integrators has doubled. In 1987, the four largest firms slaughtered less than a third (29 percent) of broilers, but by 2012 the four largest firms slaughtered nearly three out of five (57 percent) of broilers.⁵⁴

These companies control the entire chicken meat production chain: operating hatcheries and specialized feed mills, contracting with growers to raise the chickens for them and running processing plants.⁵⁵ Production contracts exist for almost all types of livestock, but the broiler industry is unique in the near-universal use of production contracts.⁵⁶ Under these contracts, the companies deliver chicks and feed to the farmers (referred to in the industry as “contract growers”), tell them how to raise the chickens and collect the birds when they have reached their full weight.⁵⁷ The farmers don’t own the chickens. These production contracts pay the growers for raising the birds, not for the actual chickens.⁵⁸

The transformation of chicken farmers from independent producers to subcontractors of the poultry companies began more than 50 years ago.⁵⁹ Over the past five or six decades, the poultry industry has strengthened its grip on contract poultry growers through unfair and often abusive “take-it-or-leave-it” contracts.⁶⁰ About half of growers have only one or two processors located near enough to get contracts, so they have little choice but to accept whatever terms the companies offer.⁶¹ Many contracts only cover growing a single flock of birds, which takes about seven weeks. Even when flock-to-flock contracts are automatically renewed, growers are dependent on the companies to maintain new deliveries of birds, and thus income.⁶²

The short-term contracts must generate enough income to support the farmers and repay significant long-term loans on their broiler houses.⁶³ Many processors demand that poultry growers invest in significant upgrades to broiler houses and other equipment to secure contracts.⁶⁴ New broiler houses are extraordinarily expensive, often costing upward of \$1 million for the four houses that most growers use.⁶⁵ Although processors require these new investments, their contracts do not pay more to the farmers, who must repay the loans required to make the upgrades.⁶⁶ Nor do growers who make upgrades receive guaranteed long-term contracts that ensure that they can pay off these debts.⁶⁷ Even after growers made the required investments, some integrators have cancelled contracts.⁶⁸

Many contract poultry growers barely break even, as the prices that growers receive for broilers have been falling steadily, while the mandated upgrade investments can mire growers in debt. In 2011, the average farm business income was \$12,700 for poultry operations with one or two houses and \$35,500 for farms with three or four houses.⁶⁹ These meager earnings can barely make a dent in the debt from poultry house upgrades. For example, Alabama poultry growers lost money during 10 of the 15 years from 1995 to 2009, the most recent year for which data are available.⁷⁰



Eggs

Eggs also are produced in large-scale operations, with hundreds of thousands of layer hens held in each facility. A handful of firms owns multiple farms or contracts with a number of large layer operations, the majority of which house their birds in small cages that are stacked from floor to ceiling. In 2013, only 11.3 percent of layer hens were in cage-free houses on farms with at least 30,000

birds.⁷¹ In 2014, the largest four firms controlled nearly one third (30.3 percent) of the hens that lay the eggs that most Americans eat.⁷² When a few firms dominate the marketplace, the major players can collude and manipulate prices and drive practices that are more intensive and larger scale. In 2009, some of the largest egg companies were implicated in a scheme to manipulate the price of eggs at the grocery store by allegedly colluding to artificially reduce egg production and drive up retail prices.⁷³

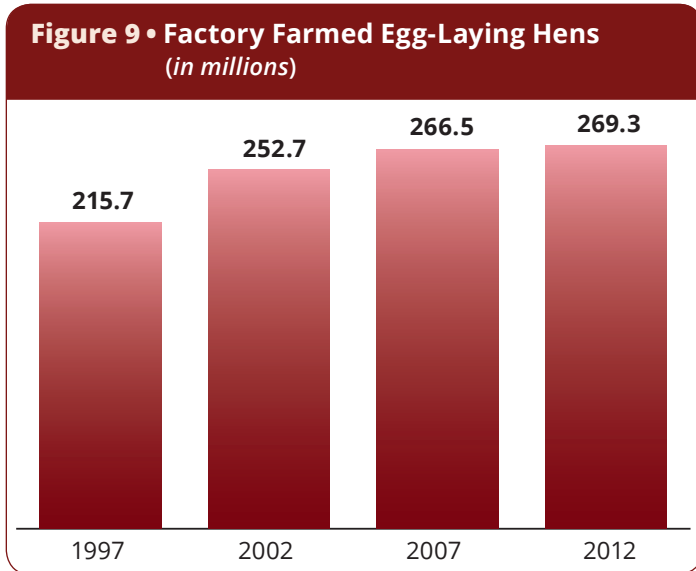
The number of egg-producing layer hens increased by one fourth (24.8 percent) over 15 years, rising from 215.7 million in 1997 to 269.3 million in 2012. (See Figure 9.) Because each hen can lay about 260 eggs a year, the additional 53.5 million hens added since 1997 produced an additional 19 billion eggs.⁷⁴ In total, the layer hen flock produced an estimated 70 billion eggs in 2012 — enough for every person to eat 220 eggs every year.

Egg production is concentrated in only a few states. Just under half the hens in 2012 were located in the top five states: 50.6 million in Iowa, 24.1 million in Ohio,

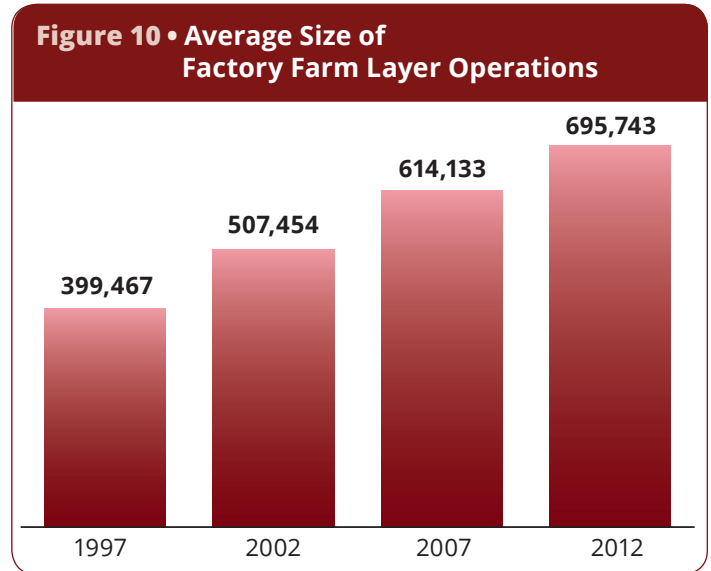
23.7 million in Indiana, 18.0 million in California and 16.1 million in Texas. Ten states had no industrial-scale layer operations at all in 2012.

Increasing Size

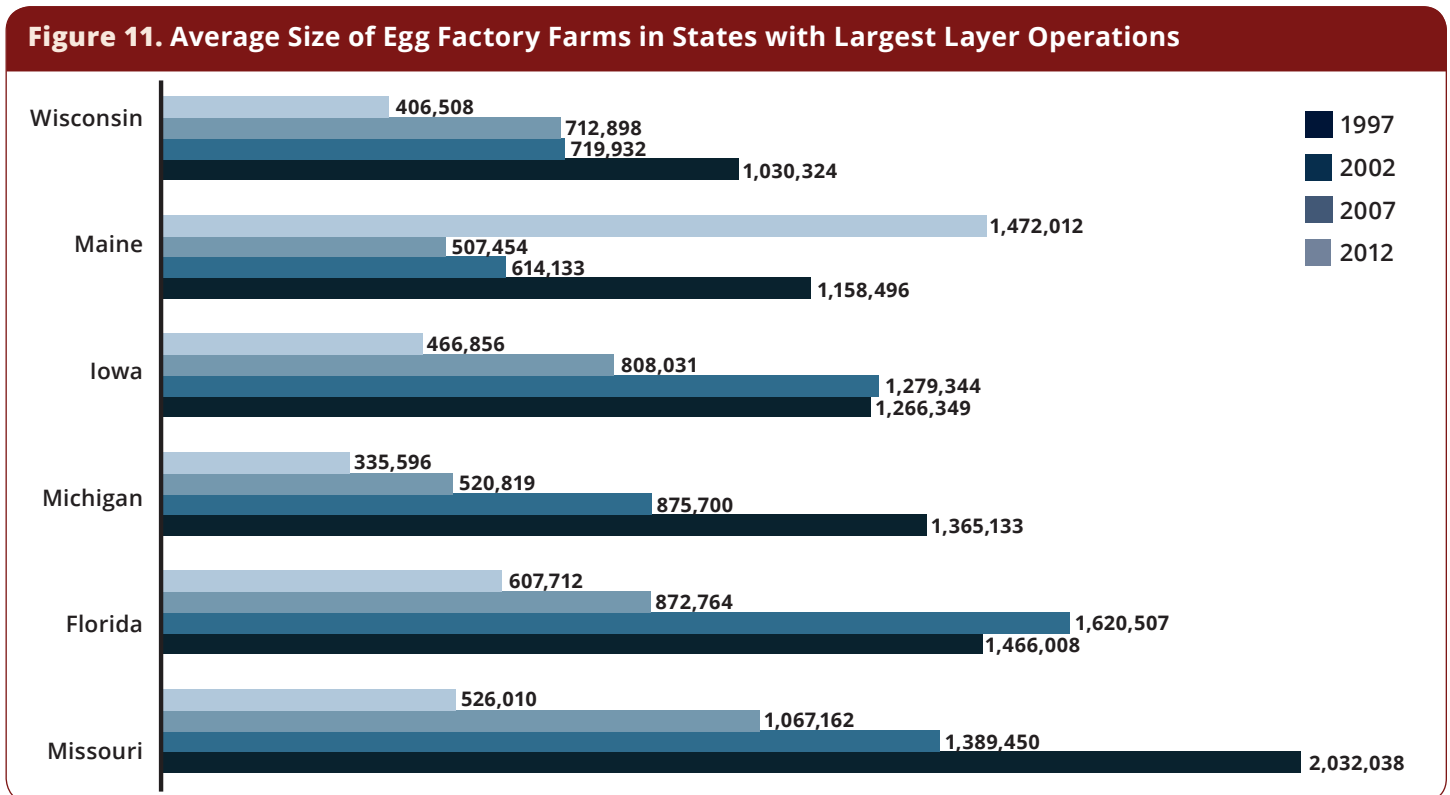
The average size of layer operations increased by 74.2 percent from 399,000 in 1997 to more than 695,000 in 2012. (See Figure 10.) The six states with the largest layer operations in 2012 (Missouri, Florida, Michigan, Iowa, Maine and Wisconsin) all averaged more than 1 million hens per farm. (See Figure 11.) These operations were both



SOURCE: FOOD & WATER WATCH ANALYSIS OF USDA DATA.



SOURCE: FOOD & WATER WATCH ANALYSIS OF USDA DATA.



SOURCE: FOOD & WATER WATCH ANALYSIS OF USDA DATA.

considerably larger than the national average and grew much faster over the 15-year period (only Maine declined from its 1997 high).

Litter Overload

Large layer facilities generate tremendous volumes of manure and manure-tainted litter. Some operations have been found to violate environmental rules. The millions of layer hens packed into some counties can produce as much litter as the sewage from major metropolitan areas. The layer hens in Mercer County, Ohio produce as much waste as the populations of the Cleveland, Cincinnati, Columbus and Dayton metropolitan areas combined. (See Table 7.)

Bad Policy Driving the Growth of Factory Farms

Industrial-scale livestock production emerged over the past quarter century, but it has accelerated rapidly over the past decade. Between 2002 and 2012, about 4.7 million livestock units were added to America’s largest livestock operations. The number of factory-farmed dairy cows, beef cattle, hogs, broiler chickens and layer hens all increased, and the average size of most operations grew significantly. Although the number of beef cattle on feedlots and broiler chickens declined modestly between 2007 and 2012 because of high feed prices and a persistent large-scale drought, the general trend over the past 15 years was for more livestock of all types to be packed onto larger factory farms, concentrated in specific regions of the country.

This growth was not due to a superior business model or to some breakthrough in efficiency; it was facilitated by poor public policy. The two largest costs of industrial livestock production — feed and manure management — have been artificially reduced by federal policies. Feed has been sold at extremely low prices, often below the cost of production, for much of the past 15 years, as a result of farm programs that promote overproduction of corn and soybeans. Although feed prices rose sharply after 2008 and remained high and volatile through 2012, prices were expected to fall in 2015 and to remain low for the foreseeable future, encouraging a renewed factory farm building spree. And while this was happening, federal and state environmental authorities turned a blind eye to the growing pollution from factory farms, allowing bad management practices to become the industry standard.

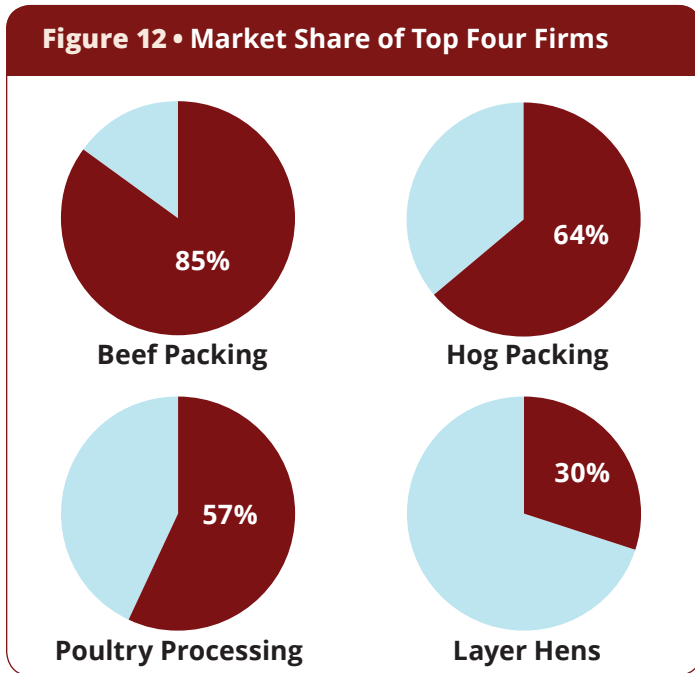
These policy changes allowed livestock operations to balloon in size, and the shift was cemented by rapid consolidation in the meatpacking and livestock processing industries.⁷⁵ (See Figure 12.) Over the past 30 years, regulators approved a wave of mergers between the largest firms in the beef, pork, poultry, egg and dairy sectors. Their concentrated market power allowed the biggest firms to exert tremendous leverage over farmers. They could lower the prices they paid to farmers because there were so few firms to bid for livestock. The big firms also pressed farmers to enter contracts — often with unfair terms and prices — that reduced meatpackers’ need to buy animals on the open market, such as a livestock auctions. As farmers received less for each steer, hog, chicken or gallon of milk, they added more livestock on factory farms to try to recoup their losses from low prices with increased volume.

TABLE 7 • Top Factory Farm Egg Counties and Human Sewage Equivalent

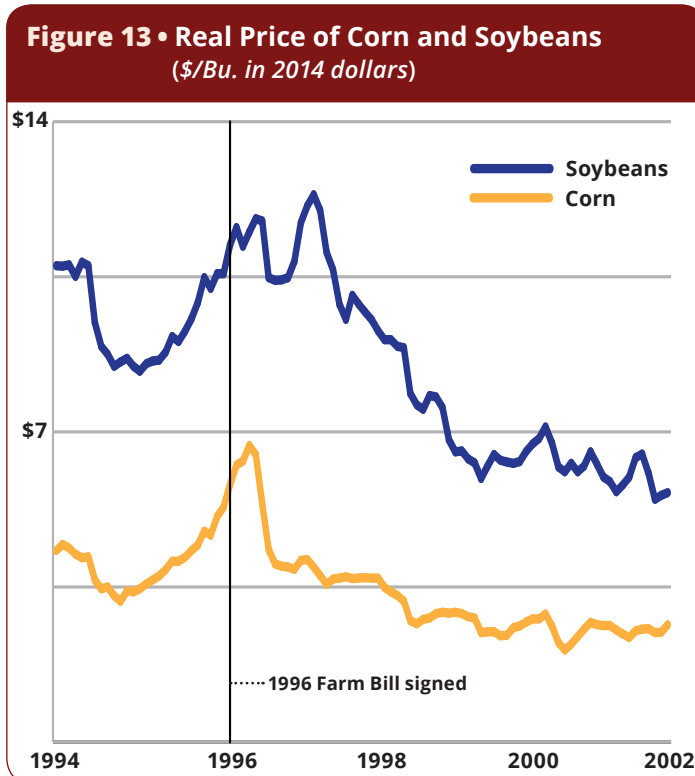
Top Factory Farm Egg Counties	Number of Layer Hens	Human Population Sewage Equivalent (millions)	Comparable Metropolitan Area
Ohio/Mercer	15,003,845	7.2	Cleveland + Cincinnati + Columbus + Dayton
Iowa/Sioux	7,598,093	3.7	6 x Des Moines
Indiana/Jay	6,556,487	3.2	Indianapolis + Gary + Lafayette
Pennsylvania/Lancaster	4,898,157	2.4	Pittsburgh
Ohio/Darke	3,914,047	1.9	Columbus
Iowa/Hancock	3,799,046	1.8	3 x Des Moines
Iowa/Wright	3,799,046	1.8	3 x Des Moines
California/Merced	3,488,943	1.7	Fresno + Stockton
Indiana/Dubois	3,278,243	1.6	8 x Lafayette
Mississippi/Smith	10,729,243	3.6	6 x Jackson, MS

The High Cost of Low-Priced Feed

Traditionally, most farmers raised livestock on pasture and also grew the feed they needed to sustain their animals over the winter. Farmers continued to pasture and cultivate feed for their animals because, prior to the 1990s, buying feed was expensive. Factory farms, however, must purchase enough grain to feed the thousands of animals that they keep at each site. Over the past 20 years, changes to federal farm policy have largely promoted the



SOURCE: USDA GIPSA; USDA ERS; WATT EGG INDUSTRY.



SOURCE: USDA NASS; BUREAU OF LABOR STATISTICS.

overproduction of feed crops such as corn and soybeans, which drove prices down from the late 1990s through the late 2000s. This reduction in feed price was an indirect subsidy for factory farm operators.

The 1996 Farm Bill, called the Freedom to Farm Act, marked the end of policies designed to stabilize farm prices. It eliminated the requirements to keep some land idle as a way to manage supply and prevent overproduction. Instead, farmers could plant crops on as much land as they wanted. Additionally, the government eliminated reserves of grain, allowing all the grain produced onto the market at once, which can drive prices down. Even the system of loans to farmers was reworked. Farmers could no longer forfeit a portion of their crops to the government as repayment for their loans if crop prices fell below the cost of production. Farmers instead sold their entire crop, further flooding the market and prices.

As a result of this drastic increase in production and timing of sales, crop prices plunged. Between 1996 and 1997, real corn prices dropped by 28 percent.⁷⁶ (See Figure 13.) The crop price free fall continued for years. By 1999, the real price of corn was 50.0 percent below 1996 levels, and the soybean price was down by 40.9 percent. As prices fell, farmers planted additional acres to try to make up for their lost income, which then caused more supply and further price drops. The Freedom to Farm Act thus became known in farm country as “Freedom to Fail.”

To quell criticism after prices collapsed, Congress authorized emergency payments to farmers that reached \$20 billion in 1999.⁷⁷ However, these payments could not make up for the decline in prices. Even with the payments, U.S. net farm income declined by 16.5 percent from 1996 to 2001.⁷⁸ In the 2002 Farm Bill, Congress voted to make these “emergency” payments permanent.

The 2002 and 2008 Farm Bills continued to replace supply and price management policies that had characterized federal farm policy since the 1930s with income supports designed to compensate for low prices generated by overproduction. Instead of programs that could put a brake on collapsing prices, government payments make up the difference between the low price that agribusiness pays farmers for crops, and the farmers’ cost of sowing, growing, harvesting and transporting the crops. Permitting crop prices to fall below their production costs and then paying farmers some of the difference with taxpayer dollars indirectly subsidizes discounted commodity purchases by meatpackers, factory farms and food processors.

Grain and oilseed prices rose sharply in 2008 and remained higher than in the prior decade until the passage of the 2014 Farm Bill. Climate change-driven weather disruptions and drought, the increased demand for crop-based biofuels and stronger consumer buying power in rapidly industrializing developing countries established the foundation for the 2008 price spike, which was accelerated by Wall Street investment firms that started to view farm production as a new investment vehicle.⁷⁹

Crop prices generally remained volatile but high between 2008 and 2012.⁸⁰ The 2014 Farm Bill was enacted in this high-price environment, allowing Congress to further weaken the farm safety net and to set the stage for a potential replay of the meltdown after the 1996 Farm Bill. The 2014 Farm Bill shifted emphasis further from the traditional farm programs into subsidized, private crop insurance that protects farmers from declining yields but not declining prices.⁸¹

These policies driving overproduction of the main ingredients in animal feed saved industrial livestock producers billions of dollars when crop prices declined. Until 2007, when commodity prices began to rise, factory farms could actually buy feed on the market at a price lower than what the grain cost to produce. A 2007 Tufts University study found that factory farms saved \$34.8 billion between 1997 and 2005 because they were able to buy feed at below-production cost.⁸² This indirect subsidy has been a key element of the so-called efficiency of factory farming.

When commodity prices rose in 2007 and 2008, meatpackers, industrial feedlots and poultry processors saw significant drops in profit as the cost of their major input — feed — started to rise. By 2014, crop prices began to fall again and were projected to remain low for the foreseeable future.⁸³ The forecast of a long-term, low-priced feed environment has encouraged a resurgence of factory farm construction for hogs and broiler chickens.⁸⁴

Weak Environmental Regulation

Weak environmental oversight reduces the cost of running factory-farmed livestock operations. Municipal sewer systems must treat the wastewater that is discharged into waterways, and factories cannot simply pump ammonia and hydrogen sulfide gas out their smokestacks without some kind of treatment. Although factory farms pay the cost of storing manure in lagoons and spraying waste on their fields, the weak environmental oversight of how manure is ultimately disposed of allows tremendous environmental and public health burdens to be put on communities surrounding factory farms.



PHOTO BY USDA-NRCS

Water Pollution

The Clean Water Act (CWA), passed in 1972, gave the EPA the authority to regulate any entity discharging pollution into national waterways, including Concentrated Animal Feeding Operations (CAFOs), the official government terminology for factory farms. The CWA set a strong and simple standard that polluting is illegal and that the national goal is *zero* discharge of pollution into our public waterways.⁸⁵ Short of actually achieving zero discharge, the CWA set limits on discharges. The EPA has considered CAFOs a “point source” of water pollution since the 1970s,⁸⁶ but it initially focused its efforts on industrial sites and sewage treatment plants, leaving CAFOs virtually unregulated for years.⁸⁷

Insufficient Permitting

The EPA, or a state agency under the EPA’s authority, sets “specific limits and conditions” on how CAFOs discharge waste into local bodies of water.⁸⁸ The most recent EPA regulations for CAFOs, released in 2008, have significant weaknesses. One of the most critical is that the rules allow individual CAFO operators to determine if they discharge or intend to discharge and thus whether they should apply for a permit.⁸⁹ According to a 2003 U.S. Government Accountability Office (GAO) report, however, “EPA officials believe that most large operations either discharge or have a potential to discharge animal waste to surface waters and should have discharge permits.”⁹⁰

Yet, according to an EPA file from 2011, an estimated 41 percent (approximately 7,600 out of 18,500) of eligible CAFOs actually had discharge permits. At the state level, the estimated number of permitted CAFOs ranges from zero to 100 percent. Thirteen states reported permitting fewer than 10 percent of their estimated CAFOs, including

states with large numbers of facilities such as Iowa, Illinois, North Carolina, Arkansas and Oklahoma.⁹¹ Even worse, of the 38 states that issue permits to CAFOs, their regulations vary widely, with some states still not meeting the EPA's rules from a decade ago.⁹²

Just as worrisome as the inconsistent permitting is the lack of information that the EPA possesses about CAFOs. Neither the EPA nor any other federal agency collects comprehensive data on the number of CAFOs or their size or location. Without that information, the EPA simply cannot regulate CAFOs effectively.⁹³ In 2013, a coalition of environmental, consumer and community groups filed suit against the EPA over the agency's failure to create an accurate, publicly available database of all CAFOs in the United States.⁹⁴ As of spring 2015, a decision in the case was pending.

The debate over the EPA's data collection grew even more intense when, in 2013, the American Farm Bureau Federation and the National Pork Producers Council filed a lawsuit against the agency to try to block it from releasing data related to factory farms and their pollution under the Freedom of Information Act (FOIA). The case was based on the industry's claim that information about factory farms — such as business names and addresses — should be private and shielded from public view.⁹⁵ The industry groups sued the EPA after the agency released factory farm data in response to FOIA requests filed after the agency withdrew a rule that would have collected basic information about the location of factory farms.

The EPA responded to industry criticism about the release of information under FOIA by recalling all of the data that it had already released and replacing it with heavily redacted data.⁹⁶ After several environmental and community organizations were allowed to intervene in the case, a judge dismissed the industry lawsuit in early 2015.⁹⁷ The industry groups wasted no time in appealing the dismissal, and, in the spring of 2015, the case was headed to a higher court.⁹⁸

Subsidizing Pollution Cleanup

The main costs of factory farms are what goes in — feed — and what comes out — manure and other livestock waste. But as the number of animals on factory farms has ballooned, federal and state environmental officials largely have ignored the growing pollution burden on rural communities, waterways and aquatic ecosystems.

The USDA offers a direct subsidy to factory farms under the Environmental Quality Incentives Program (EQIP). The 2002 Farm Bill dedicated 60 percent of program funding to livestock operations, including manure management systems.¹⁰⁷ Taxpayers paid \$179 million between 2003 and 2007 to cover manure management costs just for industrial dairy and hog operations under EQIP.¹⁰⁸ The most recent Farm Bill increased the maximum payment for EQIP from \$300,000 to \$450,000 per contract, allowing for larger industrial-scale projects to be covered under the program.¹⁰⁹

EPA Oversight of State Permit Programs

Iowa and Illinois, two states with more than 1,450 factory hog farms and cattle feedlots,⁹⁹ have such failed permitting systems that the EPA intervened to try to correct the course of permitting factory farms in these states.

Iowa: In 2007, several environmental groups filed a petition to the EPA requesting investigation of improper handling of CAFO discharges in Iowa.¹⁰⁰ The EPA's preliminary report found that in nearly half of cases it reviewed, the Iowa Department of Natural Resources (DNR) either "failed to act or did not follow its enforcement policy" in cases of permit violations. Additionally, Iowa DNR did not enforce adequate penalties against CAFOs for violations, nor was it consistent in requiring permits.¹⁰¹ In 2013, the EPA and Iowa DNR reached an agreement.¹⁰² The final agreement was less stringent than a proposed EPA draft, however, and watchdog groups continue to report slow progress in meeting the agreement.¹⁰³

Illinois: The Illinois Citizens for Clean Air & Water petitioned the EPA to remove Illinois' authority to manage its permit program in 2008. The EPA found that Illinois' program did not "meet minimum thresholds for an adequate program," failing in several measures.¹⁰⁴ In 2013, the EPA and the Illinois EPA agreed to prioritize issuing permits to previously unpermitted CAFOs that may have been in violation of the Clean Water Act.¹⁰⁵ The initial report declared that Illinois needed to "develop and maintain a comprehensive inventory of CAFOs and evaluate their regulatory status," an ironic recommendation when the EPA fails to do so nationally.¹⁰⁶

Air Pollution

Federal law requires all facilities — factories or factory farms — to report any *significant* accidental releases of certain dangerous air pollutants, like ammonia.¹¹⁰ In practice, the EPA does almost nothing to prevent factory farms from releasing dangerous air pollutants.

In 2005, the EPA announced a compliance agreement with the large-scale livestock industry that exempted participating operations from air quality violations if they joined a study on factory farm air emissions.¹¹¹ This was a sweet-heart deal for factory farms. The EPA managed a program of university researchers that monitored air pollution from a small number of participating operations, while all participating operations would be excused from provisions of the EPA's air quality enforcement.¹¹² According to the EPA, approximately 90 percent of the "largest" factory farms signed the agreement.¹¹³

The EPA claimed that, without the study, it did not have enough data on air emissions to apply the Clean Air Act to factory farms.¹¹⁴ Yet, according to the GAO and the EPA's own science advisers, this study might not even provide the necessary information to oversee air pollutants because of incomplete data collection and a distorted sample of facilities.¹¹⁵

In 2008, the EPA announced that all but the very largest factory farms and those already participating in the compliance agreement were to be exempt from reporting large releases of hazardous chemicals into the air.¹¹⁶ Industry groups, apparently not realizing that factory farms previously had been required to report emissions, sued the EPA. The industry claimed that the reporting requirements for a fraction of factory farms was a new obligation, rather than the massive deregulation that it was.¹¹⁷ A coalition of envi-



PHOTO BY USDA-NRCS

ronmental groups sued the EPA to remove the exemptions, but the court sent the rule back to the EPA in 2010 after the agency said it would reconsider the exemptions. Because the EPA never reconsidered its rule, the groups sued again in 2015, asking the court to re-open the challenge to the exemptions.¹¹⁸

As of 2015, the EPA's studies continue without any clear end point. Meanwhile, the factory farms that agreed to be part of the study still maintain their exemptions from any compliance measures if they are found to be polluting — and regulatory initiatives remain on hold.¹¹⁹

The High Costs of Factory Farms

Water Pollution and Manure Spills

Manure from factory farms poses a significant risk to communities and the environment. According to the EPA, agriculture remains a major source of water pollution.¹²⁰ And according to the GAO, "manure and wastewater from animal feeding operations can adversely impact water quality through surface runoff and erosion, direct discharges to surface water, spills and other dry-weather discharges, and leaching into the soil and groundwater."¹²¹

States have identified animal feeding operations specifically as the polluters of almost 20,000 miles of rivers and streams and over 250,000 acres of lakes, reservoirs and ponds.¹²² While livestock waste in appropriate quantities can serve a useful purpose as fertilizer for crops, the huge concentration of animals in factory farms leads to excessive concentrations of waste.¹²³

Unlike in cities, where human waste ends up at a sewage treatment plant, untreated livestock waste is flushed out of confinement buildings into large cesspools, or lagoons. These waste pools can leak or burst, especially during storms, spilling into local waterways, killing fish and spreading waste and odor across communities. Manure from lagoons is applied to fields as fertilizer, but when the application exceeds the ability of fields to absorb the nutrients, the residual nutrients from manure — mostly nitrogen and phosphorus — and bacteria leach off fields and into groundwater and rivers.¹²⁴

The long list of contaminants making their way from manure into drinking water includes heavy metals, antibiotics and pathogenic bacteria.¹²⁵ Six of the 150 pathogens found in animal manure are responsible for 90 percent of human food- and water-borne diseases: *Campylobacter*, *Salmonella*, *Listeria*, *E. coli* 0157:H7, *Cryptosporidium* and *Giardia*.¹²⁶

Even small amounts of pathogenic bacteria in drinking water can lead to disease.¹²⁷ For example, in 2006, an early thaw leached *E. coli* and bacteria from the 260 million gallons of manure produced by 41,000 dairy cows in Brown County, Wisconsin. It polluted more than 100 nearby wells.¹²⁸ Residents of the town of Morrison, Wisconsin suffered from chronic diarrhea, stomach illnesses and ear infections, and one household that tested its tap water found *E. coli*, coliform bacteria and other contaminants associated with livestock manure.¹²⁹ In 2014, liquid manure from a 4,000-cow dairy farm in New York contaminated six residential water wells with *E. coli*.¹³⁰

Air Pollution and Odors

Factory farms can release significant volumes of toxic chemicals into the air. Decomposing manure releases

ammonia and hydrogen sulfide gases in concentrations that are potentially harmful to nearby residents.¹³¹ The GAO reported that storing large quantities of livestock manure on factory farms could cause emissions of “unsafe quantities” of ammonia, hydrogen sulfide and particulate matter.¹³²

Overexposure to hydrogen sulfide can cause dizziness, nausea, headaches, respiratory failure, hypoxia and even death.¹³³ Factory farm hydrogen sulfide releases have contributed to excess diagnoses of respiratory and digestive disturbances; workers in factory farm facilities experience high levels of asthma-like symptoms, bronchitis and other respiratory diseases.¹³⁴ In liquid manure holding pits, releases of hydrogen sulfide can exceed lethal levels when waste from the lagoons is agitated prior to being pumped out of the facility.¹³⁵

A Fine Mess

My wife and I have lived on the Door Peninsula in the same neighborhood for 36 years. It is the thumb on Wisconsin that sticks out into Lake Michigan. Door County is billed as the “Cape Cod” of the Midwest, with over 300 miles of shoreline along Green Bay and Lake Michigan, serving as a major tourist destination.

On the morning of September 16, 2014, we learned that the dairy farm a quarter mile west of us had a manure system malfunction that resulted in 640,000 gallons of liquid manure flowing across fields into Sugar Creek. This was one of the largest manure spills in Wisconsin history, and the second manure spill by a large farm within a week in the county.

The days following the spill demonstrated how inept, ill-equipped and incompetent various county departments and state agencies such as the Department of Natural Resources were in dealing with the spill. It took the county health department eight days after the spill to notify residents that we should take precautions such as testing wells and buying bottled water to drink. One week after the spill, and following some rain over the ensuing weekend, state environmental officials ordered the farmer to remove the retaining dikes in the creek, allowing the remaining effluent (now swelled to over 3 million gallons) to simply flow downstream into a bay that connects to Lake Michigan. No attempt was made to inform property owners further downstream of the mess headed their way.

A simple check valve in the manure system that would have prevented the whole mess was reportedly not installed, evidently with the permission of county soil and water officials who approve the design of manure systems. To date, no county employees have been held accountable for their role in these incidents, including the poorly designed system and the failure to enforce compliance with required nutrient management plans. To top this off, the county had no manure spill emergency plan.

But despite the inept response by county and state departments, it is clear that taxpayers will take a financial hit in the aftermath of this spill — paying for personnel to supervise the cleanup, the cost of testing well water and the impact on tourism and other costs of the further degradation of state waters by all this effluent being allowed to simply flush downstream.

– John Bobbe

Executive Director of the Organic Farmers’ Agency for Relationship Marketing, Inc., an organic grain and livestock marketing cooperative with members in 19 states

Too Much Manure: Spills, Foam, and Explosive Bubbles

Storing vast quantities of manure, whether liquid in lagoons or solid in piles, creates the opportunity for spills. These spills can unleash thousands or even hundreds of thousands of gallons of waste that contaminates drinking water, kills wildlife and ruins recreational activities. Manure storage also presents unique hazards for regulators and communities to manage.

Overwhelming Spills

Nebraska: In 2012, a beef feedlot housing 83,000 cows agreed to pay a \$145,000 civil penalty for 13 violations for spills that released a total of 140 million gallons.¹⁴⁶ That works out to only a dollar for almost every 1,000 gallons spilled.

Minnesota: In 2013, a dairy farm spilled approximately 1 million gallons of manure from a football-field-sized lagoon.¹⁴⁷

Wisconsin: 2013 was the worst year for manure spills in the state in seven years, with over a million gallons spilled. One farm's manure digester alone discharged 300,000 gallons directly into a local creek.¹⁴⁸

Health Concerns

Maryland: In 2009, a 1,000-cow Frederick County, Maryland dairy operation reimbursed the county and a local city \$254,900 for providing emergency water supplies, testing and other costs after a 576,000 gallon manure spill in 2008 polluted the town's water supply, which had to be shut off for two months.¹⁴⁹

Michigan: In 2014, an estimated 20 million gallon lagoon released an unknown amount of raw manure that polluted a local creek, leading to a health advisory to avoid any contact with the water.¹⁵⁰

Fish Kills and Environmental Damage

Iowa: Manure discharges from Summit Dairy in O'Brien County polluted a 28-mile length of a stream that killed more than 860,000 fish. The Iowa Department of Natural Resources estimates the value of the fish to be nearly \$160,000.¹⁵¹ A trench built to drain water from a construction site at the dairy exacerbated the problem.¹⁵²

Minnesota: In 2009, a 250,000 to 300,000 gallon manure spill from a 660-head Pipestone County, Minnesota dairy leaked into a tributary after a pipe

(continued on next page)

One 1,500-cow dairy in Minnesota released so much hydrogen sulfide gas in 2008 that the state evacuated nearby residents and declared the dairy a public health hazard.¹³⁶ Although residents had complained about odors from the dairy for years, the Minnesota Pollution Control Agency did not install a monitor to measure emissions until the spring of 2008.¹³⁷ Emissions levels remained high throughout the summer. That October, the Minnesota Department of Health declared the Excel Dairy a public health hazard, the first time that Minnesota declared a large livestock operation a public health risk.¹³⁸

Exposure to a variety of pollutants from factory farms can lead to lung problems such as irritation and impaired breathing.¹³⁹ Children exposed to factory farm pollutants face higher likelihood of having asthma or taking medication for wheezing.¹⁴⁰ Workers at hog facilities experience more bronchitis and asthma than average.¹⁴¹

In addition to the health risks, factory farm odors diminish the quality of life for neighbors who can no longer hang their laundry out to dry, picnic in their yards, sit on their porches or even open their windows. Odors from factory farms have been associated with physical symptoms such as headaches, eye irritation and nausea.¹⁴² In North Carolina, hog factory farms are most often located in lower-income, minority communities, disproportionately affecting those with the least ability to stand up to adverse conditions imposed by neighboring facilities.¹⁴³

In 2010, a Missouri jury awarded \$11 million to neighbors of Premium Standard Farms who complained of odors from the 1.8 million hogs produced annually on the company's Missouri operations.¹⁴⁴ The significant nuisance of living near the overwhelming stench of factory farms even erodes the financial health of the facilities' neighbors. A 2008 study of house sales in Iowa found that homes within three miles or downwind of a factory farm received lower prices when selling their homes.¹⁴⁵

Impact on Farmers

The consolidation of economic power in the meat industry harms the livelihoods of independent, medium-size and smaller farmers and slaughterhouse workers. As factory farms increase in number, research shows that rural employment and income decline. A 2003 study of nearly 2,250 rural counties

(Too Much Manure *continued from page 23*)

between manure basins clogged. The spill killed fish and closed a state park to swimmers for Memorial Day weekend after heightened levels of fecal coliform bacteria were found in the park's waters.¹⁵³

Wisconsin: In 2014, a dairy farm accidentally released 50,000 gallons of manure into a local stream that "killed all the fish in that part of the stream." Even though the farm promptly reported the spill to the Department of Natural Resources, the environmental damage was extensive.¹⁵⁴

Idaho: In 2010, the EPA ordered a Grand View feedlot containing between 30,000 and 65,000 head of beef cattle to cease discharging fecal bacteria-contaminated water from its stock watering system into a tributary of the Snake River. The EPA noted that the feedlot "discharges a tremendous volume of contaminated water into a river already impaired by bacteria and nutrient pollution."¹⁵⁵

Iowa: In 2009, 25,000 gallons of manure released over a farm field at a Mitchell County hog operation killed 150,000 fish over four miles of a local stream.¹⁵⁶

Virginia: In 2010, the EPA ordered a 100,000 broiler chicken operation to cease discharging pollutants from large piles of uncovered chicken manure that were leaching nitrogen and phosphorus into a tributary of the Shenandoah River.¹⁵⁷

Unique Hazards

Manure Lagoon Bubble: In 2010, at a 1,650-cow Randolph County, Indiana dairy operation, a manure lagoon liner detached, floated to the surface of the lagoon and became inflated with decomposing manure gases.¹⁵⁸ The manure bubbles were large enough to be seen from satellite photos, but the operator, who had declared bankruptcy after milk prices collapsed, could not afford to repair the liner.¹⁵⁹ After the county shut down local roads and banned school buses from the surrounding area because of the risk posed by potential noxious gas releases or explosions, Indiana environmental officials deflated the bubbles.¹⁶⁰

Manure Foam: Manure foaming is an unpredictable, and as yet unpreventable, process in which bubbles form in manure, creating an unusual "thick, mucous consistency." The manure foam bubbles contain methane and hydrogen sulfide, posing a risk of explosions and fire. Release of the gases themselves can harm people and animals. Attempts to treat manure foam in hog facilities have had mixed success.¹⁶¹ In Minnesota alone since 2009, foaming manure conditions on at least 20 hog factory farms have caused fires or explosions.¹⁶² One explosion lifted a hog barn off the ground and threw the farmer 20 feet from the building. A study of hog farms in Minnesota, Iowa and Illinois found that 25 percent of the surveyed farms had foam in their manure pits. Researchers are still investigating the causes of manure foam and strategies to manage it safely.¹⁶³



PHOTO BY USDA-NRCS

Natural Disasters: In 1999, Hurricane Floyd hit North Carolina. The storm flooded 50 lagoons and caused 3 of them to burst, which led to the release of millions of gallons of manure mixed with the rising floodwaters. Approximately 30,500 hogs, 2.1 million chickens and 737,000 turkeys drowned.¹⁶⁴

Manure Digester Explosions: Some farms use anaerobic digesters to store manure and generate energy from the methane gas that manure releases as it decomposes. Methane is flammable, however, and that can lead to problems.¹⁶⁵ In Wisconsin, a faulty 1.25 million gallon dairy farm manure digester was linked to manure spills and a major explosion.¹⁶⁶ A methane leak on another dairy farm digester in Oregon sparked a fire in 2012.¹⁶⁷

Figure 14 • Number of Iowa Hog Farms

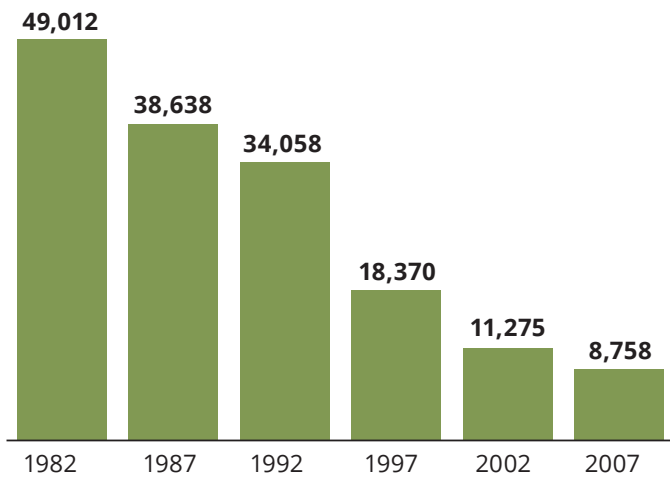


Figure 15 • Average Number of Hogs Sold per Iowa Farm

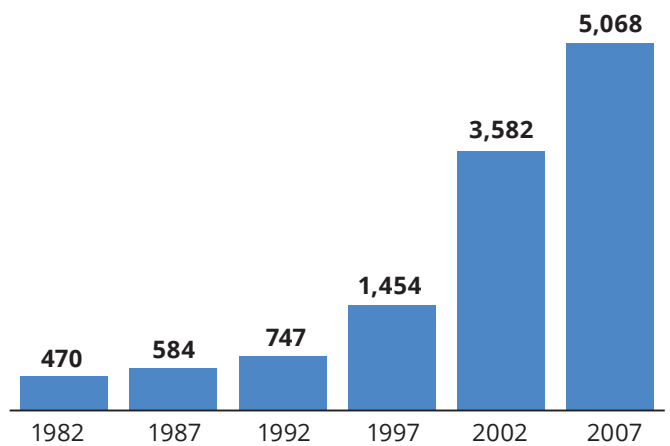
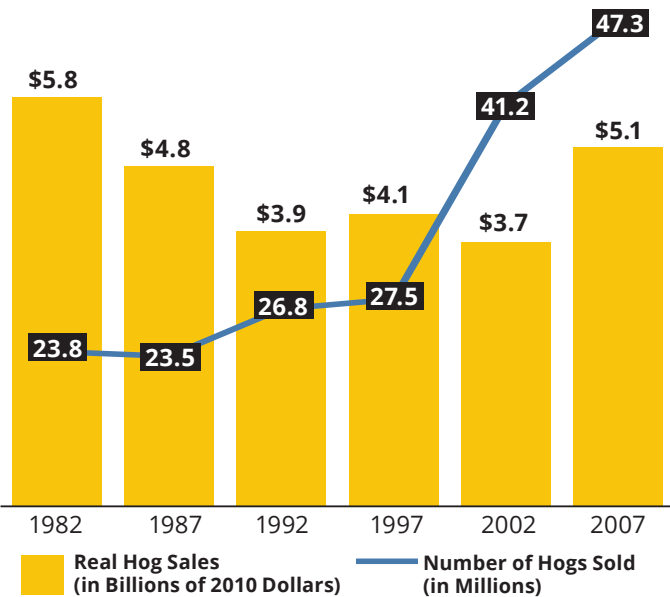


Figure 16 • Value of Real Hog Sales Falls as Total Number of Hogs Sold Doubles



SOURCE – FIGURES 14, 15 AND 16: FOOD AND WATER WATCH *ECONOMIC COST OF FOOD MONOPOLIES*.

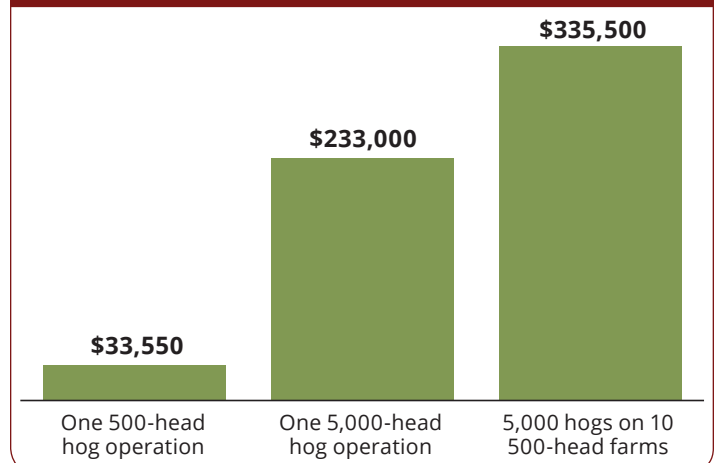
nationwide found that counties with larger farms had lower levels of economic growth, suggesting that larger farms make smaller contributions to local economies.¹⁶⁸

As a longtime player in U.S. hog and pork production, Iowa is a prime example. Between 1982 and 2007, the number of hog farms in the state plunged from just over 49,000 to just under 9,000 (see Figure 14), while the average number of hogs per farm rose from just under 500 to just over 5,000, a 10-fold increase (see Figure 15).¹⁶⁹ The economic value of the hog industry in the state declined, even as it sold more hogs from fewer farms. Hog sales more than doubled between 1982 and 2007, but the total inflation-adjusted value of the hogs dropped by 12 percent. (See Figure 16.) Iowa shed 41.6 percent of its farm jobs between 1982 and 2007, amounting to 64,000 positions statewide.¹⁷⁰

Between 2004 and 2011, the plants owned by the top four pork-packing firms slaughtered 9 out of 10 hogs in Iowa.¹⁷¹ Even accounting for hog sales across state lines, Iowa farmers sold their hogs into a market where the four largest firms slaughtered 4 out of 5 hogs, which makes Iowa considerably more concentrated than the national market.¹⁷²

Both agricultural workers and their surrounding communities can feel the impacts of this concentration. While independent medium- and small-scale farmers are more likely to buy their supplies locally,¹⁷³ circulating earnings across local communities and generating an economic “multiplier effect,”¹⁷⁴ large-scale farms rely far less on local sources. A University of Minnesota study revealed that smaller livestock operations (less than \$400,000 in income) spent between 60 and 90 percent of their purchases locally, compared to less than 50 percent of the purchases by farms with income over \$600,000.¹⁷⁵ (See Figure 17.)

Figure 17 • Local Spending by Hog Farms

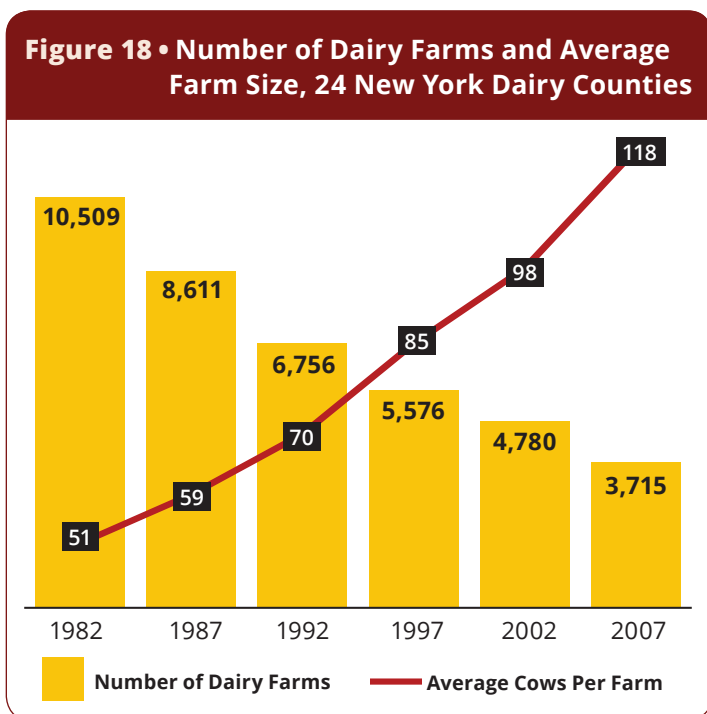


SOURCE: ALBELES-ALISON & CONNER 1990.

New York’s dairy industry has seen a similar transition, losing 65 percent of its dairy farms between 1982 and 2007, while the average herd size doubled. A 2012 study of two New York counties revealed an inverse correlation between dairy farm sizes and real median household income levels, real total personal incomes and the number of small businesses.¹⁷⁶ (See Figure 18.) Between 1982 and 2007, St. Lawrence County saw the loss of 77 percent of its dairy farms, while its remaining dairy farms grew 183 percent larger. In contrast, Yates County, which doubled its number of dairy farms, maintained a low number of cows per farm. Yates County experienced better economic indicators over that time period compared to St. Lawrence County, including a fivefold increase in small businesses.¹⁷⁷

Impact on Communities

With all of the harmful environmental, social, economic and public health impacts of factory farming, it comes as no surprise that citizens and communities near factory farms have attempted to fight back against the spread of these facilities. Some municipalities and counties have tried zoning restrictions and siting requirements for new factory farms, while others have tried to prevent corporate and foreign ownership of farms. However, in many parts of the country, agribusiness has been able to exert considerable influence, and state legislatures have acted on behalf of corporate agriculture by taking control away from local governments and handing it over to state agencies that are heavily influenced by factory farming interests.



SOURCE, FIGURES 14, 15 AND 16: FOOD AND WATER WATCH *ECONOMIC COST OF FOOD MONOPOLIES*.

In Ohio, proponents of industrial livestock production launched an offensive in 2009 designed to wrest oversight of livestock operations from state agricultural and environmental agencies and shift it to a commission that could be easily dominated by special interests representing factory farms. In 2009, a referendum backed by major agribusiness interests, including the Ohio Farm Bureau and the Ohio Pork Producers Council,¹⁷⁸ changed the Ohio state constitution by establishing an appointed Livestock Care Standards Board that would have unchecked power to establish standards for livestock and poultry in the state. Because agribusinesses outraised the critics of the referendum by more than 50 to 1, the initiative passed and successfully provided the industry with a way to regulate itself.¹⁷⁹

In 2005, the Pennsylvania legislature essentially eliminated local control of agriculture when it passed the Agricultural, Communities and Rural Environment Act, a bill that allowed the state’s attorney general to sue municipalities on behalf of factory farm owners if local ordinances “restricted” agricultural operations or ownership.¹⁸⁰

Also in 2005, Indiana governor Mitch Daniels announced his intention to double pork production in the state by 2025.¹⁸¹ With minimal public input, Governor Daniels and his new Department of Agriculture quickly established rules to increase the number of factory farms in the state.¹⁸² The rules included limiting citizens’ ability to sue factory farms for losses in their property values,¹⁸³ creating model zoning restrictions to facilitate siting new factory farms,¹⁸⁴ and fast tracking hog factory farm permits through the Indiana Department of Environmental Management.¹⁸⁵ In return, residents have experienced rivers polluted by millions of gallons of spilled manure,¹⁸⁶ tens of thousands of dead fish,¹⁸⁷ and community strife and unrest.¹⁸⁸

Community organizations in Missouri have had to repeatedly fight to maintain local government control over factory farms. For more than a decade, agribusiness has attempted to push measures through the Missouri legislature that would eliminate local control, and each time, citizens have successfully preserved their right to protect their communities. According to Rhonda Perry, a livestock and grain farmer and program director of the Missouri Rural Crisis Center, “Missouri’s family farmers, rural citizens and landowners have seen firsthand what these corporate-controlled industrial livestock operations have done to local economies, the environment and rural health. In response, our local elected officials have exerted ‘local control’ by passing health ordinances and making

these operations more accountable to the people, taxpayers and environment of the county. At the state legislature, corporate agribusiness lobbyists and their allies attempt to take away local control from our counties and their citizens, but every year family farmers and rural people stand up and say ‘NO! Government is best when it is closest to the people.’”¹⁸⁹

The battle over local control shows the lengths that agribusiness will go in order to have its way. By trying to resist local democratic processes, the industry is trying to consolidate not only the markets for livestock, but also its control over public policy.

Impact on Consumer Prices

Despite claims about the supposed efficiency gains of the factory farm model, the real prices that farmers received for their livestock have been falling for decades, and few of these savings are passed on to consumers. The largest meat and milk companies, along with the big grocery chains, can seize more of the margin between the farmgate and retail prices. Since the mid-1980s, the inflation-adjusted cost of a market basket of groceries has risen relatively steadily.¹⁹⁰ In contrast, the farmer’s share of the same market basket of groceries remained at about a

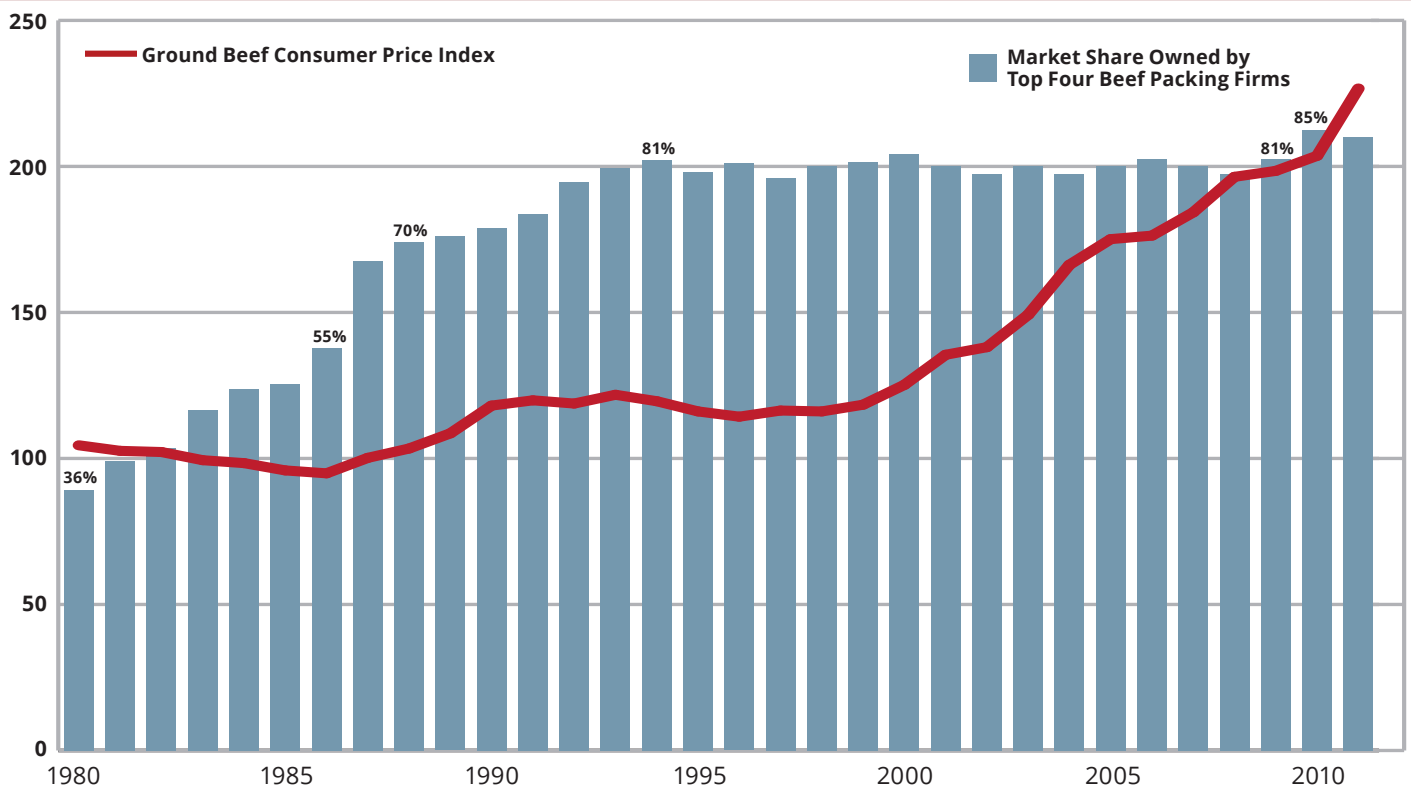
third of the retail grocery sales between 1960 and 1980, but then declined sharply to 24 percent in 1990 and about 16 percent in recent years.¹⁹¹

Consolidation is a big contributor to rising grocery prices. When more rivals compete for shoppers’ attention, they tend to compete by offering the best prices possible, but when there are few rivals, there is no competitive pressure to keep price hikes in check. Once consolidation becomes entrenched, prices seem to rise steadily.¹⁹² (See Figure 19.)

Between 1980 and 1995, the market share of the top four beef packing firms essentially doubled. The biggest four firms slaughtered one out of three beef cattle in 1980 but four out of five in 1995, and ground beef prices rose modestly by about 11 percent. Since 1995, the beef packing industry has remained significantly consolidated, with the largest firms controlling about 85 percent of the market. Consumer prices for ground beef almost doubled from 1995 to 2011.

Dairy products present the starkest picture of the disconnect between what consumers pay in the grocery store and what farmers get paid. When milk prices collapsed between 2007 and 2009, the price that consumers paid for dairy products fell only modestly — if at all. Between July 2007 and June 2009, the real price that farmers received

Figure 19 • Ground Beef Prices and Beef Packing Consolidation



SOURCE: USDA GIPSA; BLS.

for milk fell by 49 percent, but the retail price for milk fell only half as fast (by 22 percent), and the price of cheddar cheese increased by 6 percent.¹⁹³ (See Figure 20.) As the Utah Commissioner of Agriculture noted, “We are concerned that retailers have not reduced the retail price of milk to reflect the huge reduction in the wholesale level.”¹⁹⁴ Very little of the money that consumers pay for milk ends up in the hands of farmers. In 2012, farmers received only \$1.50 for every \$4.89 gallon of milk.¹⁹⁵

Impact on Public Health

Even people who don’t live in rural communities are harmed from factory farming. Practices common on factory farms can lead to foodborne illness, including *E. coli* and *Salmonella* contamination and the risk of mad cow disease. The large number of animals raised in cramped conditions creates a perfect breeding ground for the formation of new diseases, and the routine use of antibiotics in factory farms can lead to the creation of deadly antibiotic-resistant bacteria.

E. coli

Cattle are uniquely suited to eat grass, but cattle finished in factory farm feedlots are instead fed grains like corn and soybeans. This practice has serious human health impacts. The diets fed to factory farm animals increase the

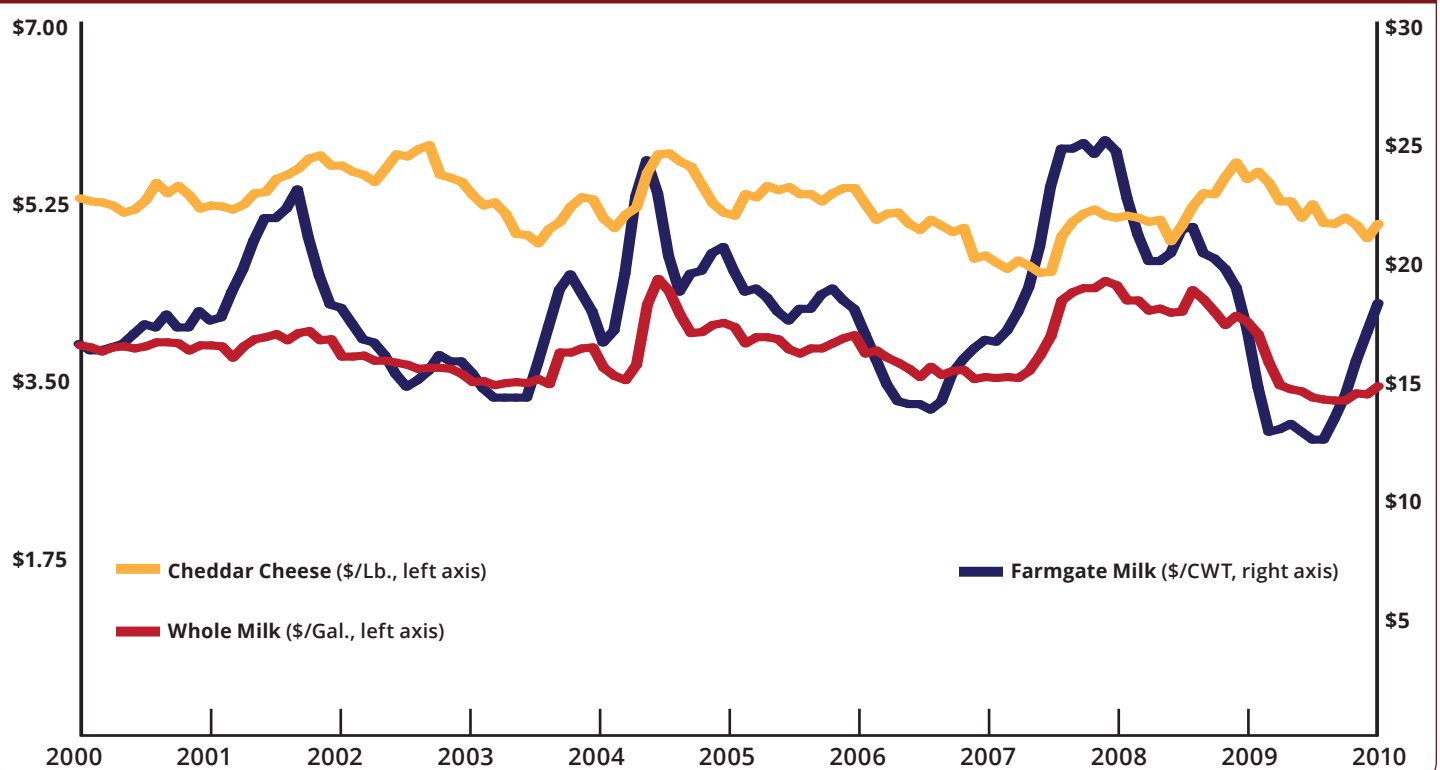
concentration and the length of time that *E. coli*, including dangerous strains like O157:H7, survives in manure.¹⁹⁶ Not only does the bacterium pass on to meat from the intestines, hides and hooves of cattle that stand in their own feces all day,¹⁹⁷ but it also can contaminate other food sources, such as vegetables.¹⁹⁸ Agricultural sources also have been shown to be a considerable source of *E. coli* in recreational waters, potentially sickening people who swim.¹⁹⁹ Antibiotic-resistant *E. coli* in food has been implicated as a cause of urinary tract infections across multiple states.²⁰⁰

Salmonella

One of the most common causes of foodborne illness, *Salmonella* is a bacteria found in the intestinal tracts of animals.²⁰¹ Meat, poultry and eggs are common sources of *Salmonella* infection for people, although produce also has been contaminated with the bacteria. The tight confinement and crowded conditions found in U.S. operations are thought to increase the risk of *Salmonella*. Surveys done in the European Union led researchers to conclude that “cage production as well as a larger flock size were associated with a higher risk of positivity [for *Salmonella*]” in eggs.²⁰²

In addition to the threat of foodborne illness posed by *Salmonella*, the medical community has worried that the

Figure 20 • Real Farmgate Milk and Retail Milk and Cheddar Cheese (in inflation-adjusted 2014 dollars)



SOURCE: USDA NASS; BLS.



overuse of antibiotics in livestock production could make these illnesses harder to treat (see below).²⁰³ Although *Salmonella* can run its course without treatment, it also can cause severe complications, especially in the very young, elderly and immune-compromised. Antibiotic resistance makes this threat significantly worse.²⁰⁴ In 2013, a *Consumer Reports* magazine study of 316 chicken breasts from across the country found that nearly 11 percent tested positive for *Salmonella* and 38 percent of the *Salmonella* showed resistance to multiple antibiotics.²⁰⁵ In July 2014, the USDA rejected a proposal to list four types of antibiotic-resistant *Salmonella* as adulterants in ground meat and poultry, a designation that triggers stronger enforcement mechanisms.²⁰⁶

Three outbreaks demonstrate the damaging impact of *Salmonella*:

- **Foster Farms Chicken:** A major outbreak of antibiotic-resistant *Salmonella Heidelberg* linked to chicken from a company called Foster Farms sickened 634 people over the course of more than a year, mainly in California.²⁰⁷ The USDA issued a public health alert about products from three Foster Farms plants in October 2013 after 278 people in 18 states had contracted *Salmonella Heidelberg*. Yet the plants remained open, and no recall was issued.²⁰⁸ Foster Farms finally issued a recall of 170 different products in July 2014,²⁰⁹ months after the initial outbreak.
- **Cargill Ground Turkey:** In the face of an illness outbreak caused by antibiotic-resistant *Salmonella*, Cargill voluntarily recalled 36 million pounds of ground turkey in August 2011, and an additional 185,000 pounds the next month.²¹⁰ This recall represented several months' worth of production from one plant in Arkansas.²¹¹ In total, 136 people across 34 states were

infected, yielding 37 hospitalizations and one death.²¹² A disproportionate number of people infected were hospitalized due to the bacteria's resistance to antibiotics.²¹³

- **Wright County Egg:** In the summer of 2010, more than half a billion eggs were recalled from two large Iowa egg companies that sickened nearly 1,500 people.²¹⁴ This case offered a stark example of how the scale of large factory farm operations can make bad management practices at just a few facilities trigger dramatic health impacts on a huge portion of the country's food supply.

Antibiotic-Resistant Bacteria

Factory farms are not only a source of foodborne pathogens, but they administer antibiotics to livestock in such a way that promotes antibiotic resistance. The Food and Drug Administration reported in 2011 that 80 percent of antibiotics in the United States are sold for agricultural purposes, and agriculture uses drugs from every major class of antibiotics used in human medicine.²¹⁵

Livestock and poultry producers typically mix low doses of antibiotics, below the amount used to treat an actual disease or infection, into animals' feed and water over long periods of time.²¹⁶ The low doses of antibiotics kill some bacteria, but not all, leaving the antibiotic-resistant bacteria to survive and thrive. Antibiotic-resistant bacteria can even share resistance genes with neighboring bacteria, worsening the problem.²¹⁷

Multiple studies have found antibiotic-resistant bacteria in many types of retail meat and poultry products.²¹⁸ In other words, when you buy meat at the grocery store, there's a decent chance that it has antibiotic-resistant bacteria on it. The Centers for Disease Control and Prevention (CDC) estimates that over 400,000 Americans experience an antibiotic-resistant infection from pathogens spread through food every year.²¹⁹

One particular antibiotic-resistant strain of bacteria has been tied directly to livestock. Methicillin-resistant *Staphylococcus*, or MRSA, is a deadly strain of staph infection that is resistant to certain antibiotics. Researchers have strong evidence that a strain of MRSA originated in humans, migrated to pigs where it acquired resistance to antibiotics commonly used in the pigs, and now is infecting humans again.²²⁰ A study has found farmworkers and pigs carrying the same strains of MRSA on conventional pig farms, but not on farms that do not use antibiotics in raising pigs.²²¹ Researchers have even found an increased

likelihood of rural residents experiencing MRSA skin infections if they live near fields treated with swine manure.²²²

Most livestock waste stored in lagoons is applied to nearby fields as fertilizer, introducing antibiotic-resistant bacteria into the local environment.²²³ The antibiotic-resistant bacteria not only spread, but share genes with naturally occurring bacteria in local fields, streams, ponds and even groundwater. These bacteria are adapted to their environment, just as the fecal bacteria are adapted to living in the digestive tracts of livestock, and may carry on reproducing with these new traits.²²⁴ Thus, antibiotic-resistant bacteria from livestock contribute to a reservoir of antibiotic resistance in the environment.

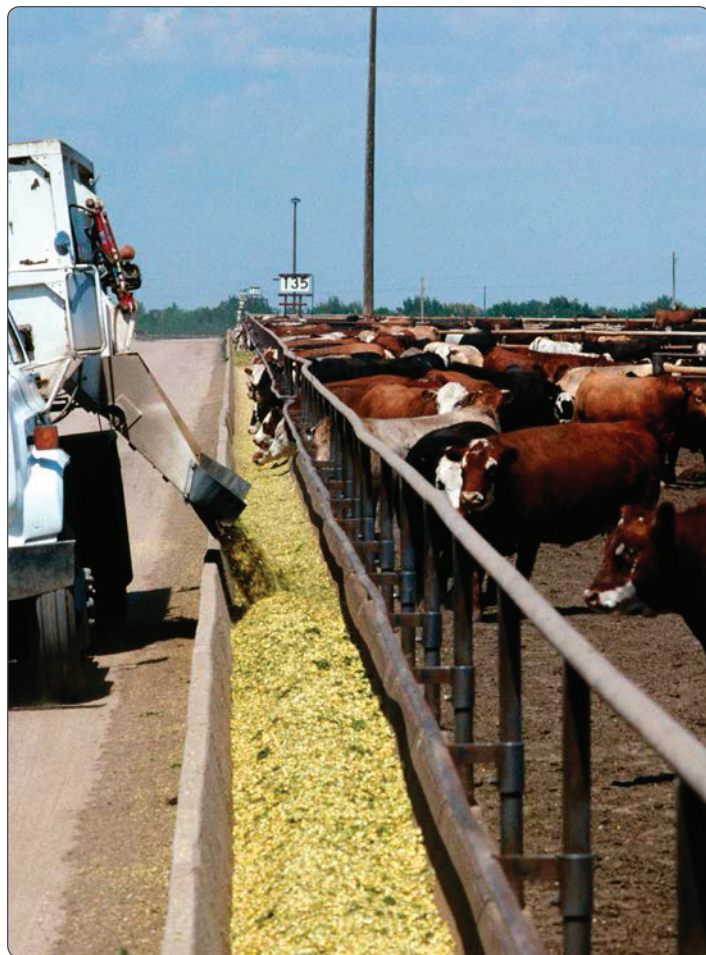
Arsenic

For several decades, U.S. poultry farmers used drugs containing arsenic (a known poison) to control the common disease coccidiosis.²²⁵ The chicken industry discovered that the arsenic-based drug roxarsone also promoted growth, increased feed efficiency and improved pigmentation of the meat.²²⁶ Between 1995 and 2000, 70 percent of chicken producers used roxarsone feed additives.²²⁷ Thanks to intervention from consumer, public health and environmental groups, arsenic use in feed is almost entirely a thing of the past.

The chicken industry maintained that arsenical drugs were safe for decades.²²⁸ Yet, while arsenic levels in meat fed arsenical drugs were too low to cause an immediate toxic response, any exposure to arsenic adds to a person's overall risk of getting cancer over a lifetime.²²⁹ Arsenic not absorbed into the animal flesh is passed out of the animal in its waste, then used for fertilizer, bringing arsenic as a contaminant into fields and rural communities and water supplies.²³⁰

In 2011, an FDA study compared two groups of chickens, raised under the same conditions, except one group was fed the maximum dose of the arsenical drug roxarsone and the other was not.²³¹ The livers of chickens fed roxarsone contained substantially more arsenic than the livers of chickens that were not, creating a “completely avoidable exposure to a carcinogen,” according to the FDA. Indeed, the results were so dramatic that Pfizer, the manufacturer of roxarsone, decided to remove roxarsone from the market pending further investigation.²³²

In the spring of 2012, the Maryland State Legislature passed a ban on arsenic use in poultry feed,²³³ another sign of waning trust in the safety of arsenical drugs. In 2013, the FDA withdrew its approval for three of the most



common arsenicals: roxarsone, carbarsone and arsanilic acid. In April 2015, the agency announced its plan to withdraw the last remaining arsenical drug, nitarosone, from the market at the end of 2015.²³⁴

Mad Cow Disease

Animal feed has long been used as a vehicle for disposing of animal byproducts.²³⁵ Scientists believe that “mad cow disease,” or bovine spongiform encephalopathy (BSE), is spread when cattle eat nervous system tissues, such as the brain and spinal cord, of other infected animals.²³⁶ Variant Creutzfeldt-Jakob disease (vCJD), which causes dementia and ultimately death in humans, is believed to be caused by eating BSE-infected beef.²³⁷ Keeping mad cow disease out of the food supply is particularly important because, unlike most other foodborne illnesses, it cannot be eliminated by disinfection or by cooking the meat.²³⁸

Four cases of mad cow disease have been confirmed in cattle in the United States — in December 2003, June 2005, March 2006 and April 2012.²³⁹ In the fall of 2006, the USDA decided to scale back testing for mad cow disease by over 90 percent, claiming that the testing was expensive and that detection of infected cows was rare.²⁴⁰

In 1997, the FDA instituted a rule that banned certain animal proteins from cattle feed, but it continued to allow those proteins in other animal feed²⁴¹ and it did not ban blood products and poultry litter from cattle feed.²⁴² In 2008, the FDA updated the rule to ban the entire carcasses of BSE-positive cattle, as well the brains and spinal cords of cattle 30 months of age or older, from all animal feed.²⁴³ A safer policy for consumers would be to remove all cattle tissues from the feed system, regardless of their age or BSE status, and also to ban restaurant plate waste, cattle blood and poultry litter from cattle feed.

Growth Hormones

In 1993, the FDA approved the use of a genetically engineered artificial growth hormone called recombinant bovine growth hormone (rBGH) to increase the milk yields of dairy cows.²⁴⁴ This artificial hormone's known side effects include increased udder infections (mastitis) and reproductive problems in cows.²⁴⁵

In addition, research suggests a link between drinking milk from rBGH-treated cows and certain types of cancer in humans. Dairy cows treated with rBGH increase production of a protein called insulin-like growth factor-1 (IGF-1).²⁴⁶ Humans naturally produce their own IGF-1, but humans drinking milk from treated cows will consume more IGF-1 than they otherwise would. Research shows that when present in the human body at elevated levels, IGF-1 increases the risk of breast, colon, prostate and other cancers.²⁴⁷

In 2007, the most recent data collected by the federal government, nearly 43 percent of large-scale dairy farms (over 500 head), 30 percent of mid-sized dairy farms and 9 percent of small dairy farms used rBGH on their cows.²⁴⁸ Yet rBGH has never been approved for commercial use in

Canada or the European Union (EU) due to concerns about the drug's impact on animal health and welfare,²⁴⁹ and it also is banned in Japan and Australia.²⁵⁰

Impact on Animal Welfare

Chickens and hogs raised in factory farms usually have no access to the outdoors, fresh air or natural light, and may spend much of their time confined in crates that are so restrictive that the animals cannot stand up, turn around or fully extend their limbs or wings.²⁵¹ Dairy and beef cattle on factory farms do not have access to pasture where they could express their natural behavior (and ideal diet) of grazing.²⁵² With 100,000 chickens or 1,000 hogs in one building, and thousands of cattle held together on one dirt lot, industrial livestock conditions make animals vulnerable to disease.

In addition to the burden put on animals from densely crowded conditions, most livestock breeds have been bred for specific production traits such as rapid weight gain, larger breasts on chickens, or high milk or egg production. For example, since the 1920s, changes to broiler chicken breeding and production have resulted in chickens that grow twice as big in half the time.²⁵³ This selective breeding, which emphasizes high production over animal fitness or welfare, has created animals that are prone to structural deformities such as lameness and bone deformities, metabolic problems and susceptibility to infections.²⁵⁴

Growth Promotion

Selective breeding that makes livestock prone to health problems is coupled with pharmaceuticals designed to make animals grow faster, such as the use of artificial growth hormones that can cause additional stress and side effects.

As an example, two drugs designed to make animals grow lean meat faster — ractopamine and Zilmax — are controversial because of animal welfare concerns. Ractopamine mimics stress hormones in pigs and stimulates increased aggressive behavior.²⁵⁵ Not only are the pigs more likely to attack each other, but their handlers also are more likely to handle aggressive animals roughly, which is dangerous for the pigs and the workers.²⁵⁶ The drug's manufacturer Elanco acknowledged that, because of aggressive behavior, pigs treated with ractopamine are at increased risk of injury during transport.²⁵⁷ In over 200,000 reports to the FDA, livestock producers reported pigs treated with ractopamine experiencing “hyperactivity, trembling, broken limbs, inability to walk and death,” leading the FDA to require that a warning label be added to the drug.²⁵⁸



While 27 countries including the United States, Canada, Mexico and Japan allow ractopamine use, 160 countries — including the EU member nations and China — do not.²⁵⁹ The U.S. government intends to force global acceptance of ractopamine, by challenging bans on the drug as illegal trade barriers.²⁶⁰ The livestock industry insists that foreign opposition to ractopamine stems from protectionism, not food safety concerns.²⁶¹ Three food safety and environmental organizations filed suit against the FDA in 2014, claiming that the agency approved ractopamine with insufficient safety and environmental testing.²⁶²

Zilmax, a very similar drug to ractopamine, has raised similar concerns. Meat producer Tyson rejected animals raised with Zilmax, citing concerns such as cattle arriving at slaughterhouses unable to walk.²⁶³ In 2014, Zilmax manufacturer Merck Animal Health suspended sales of the drug in order to audit its use, while still touting its safety.²⁶⁴ The FDA has approved adjustments to the drug label that would require lower doses, a likely precursor to returning Zilmax to the market.²⁶⁵

Biotechnology and Cloning

If the biotechnology industry has its way, livestock production and aquaculture soon will incorporate even more exotic technologies that could impact the welfare of animals. As of the spring of 2015, the FDA continues to consider the regulatory application of AquaBounty Technologies' genetically engineered (GMO) salmon, which, if approved, would be the first biotech animal to enter the food supply anywhere in the world. Among other problems, the very limited available scientific research on GMO salmon suggests that the fish experience unique health problems and higher rates of abnormalities compared to unmodified salmon.²⁷¹

The FDA already has approved cloning of food animals and declared cloned animals to be safe for human consumption.²⁷² Cloning animals is an inexact science with survival rates as low as 5 percent.²⁷³ A New Zealand biotechnology company ended its cloning program in 2011 due to unacceptable death rates.²⁷⁴ Internal hemorrhaging, digestive problems and multiple organ failure are some of the most common causes of death among cloned animals in the first week of life.²⁷⁵ Regulators have typically brushed aside potential health impacts for people eating these engineered or cloned food animals, or for the welfare of the animals themselves due to deformities and susceptibility to disease.

These technologies represent more dramatic attempts by meat companies to force animals into their preferred

production models instead of adapting production systems that maximize animal welfare, ensure the wholesomeness of the food produced there or protect the environment.

Secrecy: "Ag Gag" Laws

For years, investigations by animal welfare activists have revealed conditions on some factory farms that result in extreme animal suffering, sometimes resulting in criminal convictions and loss of business for the farms. Rather than develop better systems for oversight of animal welfare on factory farms, however, some states have responded by making certain types of activism illegal through so-called "ag gag" laws. Ag gag laws can ban undercover videotaping of farms or require that any video tapes be immediately delivered to authorities, preventing groups from gathering sufficient evidence to demonstrate a pattern of inhumane livestock treatment.²⁶⁶

Seven states — Idaho, Iowa, Kansas, Missouri, Montana, North Dakota and Utah — have passed "ag gag" laws.²⁶⁷ But these changes are not happening without a fight. In 2013, ag gag legislation in 11 states was defeated, as animal welfare groups have joined with civil liberties groups and others to oppose these harmful bills.²⁶⁸ The governor of Tennessee vetoed an ag gag bill passed in the state legislature, citing weaknesses in the bill that threatened prosecution of animal cruelty cases.²⁶⁹ In addition, both Idaho's and Utah's ag gag laws are being challenged by lawsuits.²⁷⁰



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False Solutions to Factory Farm Pollution

Several recent proposals are aimed at filling the void created by the EPA's failure to regulate water quality problems related to factory farms. But these approaches continue the trend of not requiring factory farms to reduce pollution and fail to hold the companies that drive these operations accountable for their waste.

- **Water Quality Trading:** Water quality trading allows one polluter to reduce pollution by a certain amount and to sell that “right” to pollute to someone else. A farmer might implement certain best management practices to reduce runoff of poultry waste applied to fields. That practice generates “pollution credits,” based on an estimated amount of pollution reduction, to sell to a sewage treatment plant, allowing the plant to release more nutrients into a waterway.²⁷⁶ Yet measuring offsets is a vague and politicized process, and trading may lead to pollution “hotspots” where credits are used to avoid reducing pollution.²⁷⁷
- **Manure Transport:** One example of how states try to manage the pollution burden from a concentration of factory farms is by shipping manure out of an overloaded watershed. For example, in the Chesapeake Bay watershed, home to about 44 million factory-farmed chickens, Maryland subsidizes the cost of shipping poultry manure elsewhere to the tune of up to \$20 per ton.²⁷⁸ Transporting manure can alleviate local concentrations of manure, but it fails to address the larger problem of having too many factory-farmed animals in one area.²⁷⁹
- **Factory Farm Waste-to-Energy Plants:** Proponents of burning animal waste claim that incineration plants can turn excess manure, especially poultry litter, into energy. But despite claims that this is a positive alternative to putting excess manure on fields, proposals for incineration facilities remain stalled due to opposition from environmental and social justice groups, dubious financial viability and well-documented health and environmental hazards of burning chicken litter.²⁸⁰ Building new power plants to burn this waste only provides another band-aid for a broken agricultural system. Moreover, such projects are not economically feasible without significant government subsidies.²⁸¹ Similarly, manure digesters are designed to convert the methane from decomposing manure into a fuel source for generating electricity, but they have been plagued by performance problems and require tax subsidies to be economically feasible.

Conclusion

The dominance of factory farm production in the United States is neither mysterious nor accidental. The growth of factory farming is the result of bad farm policies that often have subsidized artificially cheap feed; lax regulatory enforcement that enabled factory farm expansion without addressing the environmental and human impacts of their massive quantities of waste; and unchecked corporate consolidation that allowed giant agribusiness companies to drive up the size of farms raising food animals.

Factory farms cause extensive environmental damage and exploit natural resources. Agribusiness interests prevent citizens from exercising democratic control in their communities and have left communities with fewer independent family farms, unsafe water, reduced air quality and depressed economies. Instead of benefiting from the supposed efficiencies in this system, consumers instead face foodborne illness outbreaks and public health threats

such as antibiotic-resistant bacteria.

Congress, regulatory agencies and states need to put a stop to the policies that have allowed these facilities to proliferate, and they must create and enforce policies that allow food to be produced in a way that enables farmers to make a living and does not harm communities, the environment or public health.

Food & Water Watch recommends:

- The EPA and states should establish a moratorium on the construction of new factory farms and on the expansion of existing facilities;
- The EPA and states should establish and enforce strong air and water pollution and water use standards, as well as pollution reporting requirements;
- The EPA and the USDA should not replace enforceable regulations on factory farm discharges with water pollution trading or other market-based efforts to create pay-to-pollute schemes;

What About Organic?

The USDA sets standards for certified organic food. For meat, poultry, eggs and dairy to be certified organic, they must come from animals that eat only organic feed (raised without synthetic fertilizers or pesticides and from crops that were not genetically engineered), and they cannot be given growth hormones or antibiotics. The organic standards do say that animals should be able to express their natural behaviors and that organic production must minimize environmental impacts. However, organic standards do not include specific animal welfare conditions, and they do not restrict the size of livestock operations.

In 2010, after years of controversy, and inaction by the USDA, the organic standards were updated to specify how much “access to pasture” organic cattle must receive and how this requirement could be enforced.²⁸² Requiring organic dairy and beef cattle to spend a significant portion of their time on, and to receive a significant portion of their nutrition from, pasture was a major step toward making sure that organic products live up to consumer expectations.

For “organic” to be even more meaningful to consumers, the USDA needs to specifically address animal welfare with standards that require outdoor access for chickens and hogs, end the use of synthetic feed additives meant to replace the nutrients that chickens would get from foraging outdoors, and outline specific animal welfare practices for stocking density, handling and transportation.



- States, the USDA and the EPA should not subsidize waste-to-energy programs for manure that enable the continued concentration of too many factory-farmed animals in one region;
- The Department of Justice should reassess the impact of major agricultural mergers and rectify any anticompetitive developments that have occurred as a result of those mergers. Further, the department should enact a moratorium on any proposed agricultural and food company mergers by the top four firms in any sector of the food system;
- The USDA should work to end unfair contract practices used in the livestock sector as well as address the unfair power exerted by meatpackers over livestock producers through marketing agreements and packer ownership of livestock;
- The FDA should ban non-therapeutic use of medically important antibiotics in livestock as well as the use of the artificial growth hormone rBGH and beta-agonist growth promoters;
- Congress should reform federal farm policies to stop encouraging overproduction of corn, soybeans and other commodities that frequently have resulted in cheap feed for animals in factory farms. This includes establishing commodity reserves to reduce price volatility and to manage the supply of agricultural commodities, and reforming the policies that set milk prices to prevent overproduction and price manipulation;
- Congress should cap payments made to farms under the Environmental Quality Incentives Program to ensure that the program no longer serves as a subsidy for factory farms;
- State legislatures should enact laws that affirmatively allow local governments to retain the authority to impose strict health and zoning regulations for factory farms and to restore them in states that previously had taken away local control.

Appendix

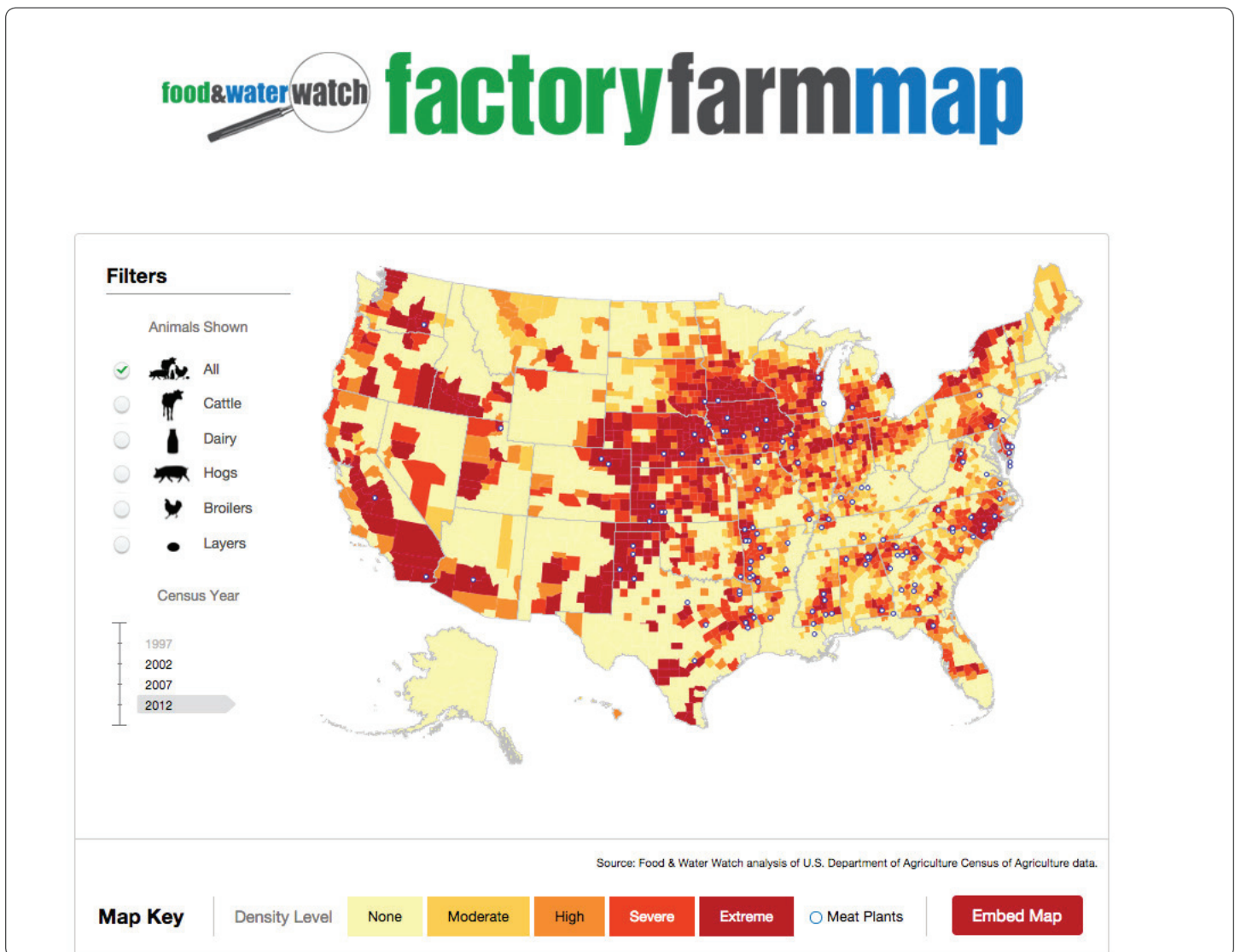
Factory Farm Map Methodology

Food & Water Watch compiled the data on the largest livestock farms from the USDA *Census of Agriculture* — a five-year survey of America’s farms — from 1997, 2002, 2007 and 2012. The *Census of Agriculture* collects and reports data from livestock operations for every county and state in the United States, including the number of operations (farms) and the number of livestock. The USDA also reports the distribution of the number of livestock on different-sized farms by state and by county. For this map, Food & Water Watch analyzed only the number of livestock on the largest categories of operations for beef cattle, dairy cows, hogs, broilers (chicken) and layers (eggs). The *Census of Agriculture* is available online at <http://www.agcensus.usda.gov/>.

Definitions

Food & Water Watch analyzed the county-level data for the USDA’s largest categories of farms based on the number of livestock — either the inventory of livestock on an operation or, in the case of broiler chickens, the annual number of birds sold. The livestock operations that were analyzed for the map and report have at least:

Factory Farm Size Definitions	
Beef cattle	500 or more beef cattle “on feed”
Dairy	500 or more dairy cows
Hogs	1,000 or more hogs
Broiler chickens (broilers)	annual sales of 500,000 or more broiler chickens
Egg-laying hens (layers)	100,000 or more egg-laying hens



“All Livestock” Calculation

Food & Water Watch compared the total number of livestock across different animal types — comparing chickens to cattle and hogs — by using the USDA definition of a “livestock unit,” which measures different kinds of livestock animals on the same scale based on their weight. A livestock unit is a comparison of 1,000 pounds of live weight based on the type of animal. One beef cattle is the equivalent of approximately two thirds of a dairy cow, eight hogs or four hundred chickens.²⁸³

The average livestock units per farm were calculated by dividing the total livestock units by the number of livestock operations. (This may slightly underestimate the size of livestock operations because some farms may raise more than one type of livestock, although it has become significantly less common for farms to have diversified livestock production.) Because the USDA did not report beef cattle on feed prior to 2002 (see below), the “all livestock” measurement covers only 2002 through 2012.

Livestock Density

The map displays the number of livestock on the largest operations in every county, by type of livestock, which is displayed on the density color scheme. The map displays five levels of livestock density, which reflect the 2007 distribution of the number of livestock by type and by county broken into four equal parts (quartiles). These levels are applied to the prior years and to 2012, which shows how livestock operations grew in size over the studied decade and a half.

Average Size

The average size of operations was calculated by dividing the number of livestock on the largest operations by the number of these large operations. The USDA *Census of Agriculture* does not disclose these figures if the number of operations in any one county is very low (about one or two operations) because doing so would effectively disclose private or proprietary information about a specific farm. For counties where the number of operations is reported but the number of livestock is not disclosed, Food & Water Watch calculated an average size of the county operations based on state figures.

In most cases, Food & Water Watch calculated a residual average within each state by subtracting the disclosed county livestock numbers from the state total livestock numbers (for the largest size category of each type of animal) and then dividing the remaining unaccounted for animals by the number of farms with undisclosed livestock numbers (total state livestock – disclosed county livestock numbers within that state / number of operations with undisclosed livestock numbers). This provides a close average for the number of livestock on operations that do not disclose the number of animals.

In some cases, the USDA does not disclose the state total for the largest-size category of livestock, but it does disclose the total number of livestock on operations of any size in the state. In this case, Food & Water Watch subtracted all of the disclosed livestock for the smaller size categories from the state total, leaving a remainder of uncounted animals in the largest size category, and then divided by the total number of large operations to get an average largest-size operation. For states that did not disclose animal numbers for smaller-size categories, Food

Factory Farm Map Density Table

Density	Map Color	All Livestock (Animal Units)	Dairy Cows	Beef Cattle on Feed	Hogs	Broiler Chickens Sold	Egg-Laying Hens
Extreme	Dark Red	More than 13,200	More than 4,200	More than 17,400	More than 48,500	More than 2.75 million	More than 1.25 million
Severe	Red	5,200–13,200	2,100–4,200	7,300–17,400	19,000–48,500	1 million–2.75 million	750,000–1.25 million
High	Orange	2,000–5,199	1,200–2,099	2,175–7,299	9,500–18,999	350,000–999,999	500,000–749,999
Moderate	Light Orange	Fewer than 2,000	Fewer than 1,200	Fewer than 2,175	Fewer than 9,500	Fewer than 350,000	Fewer than 500,000
Low	Yellow	None	None	None	None	None	None

& Water Watch used the median value (for example, using 150 for the 100–199 size range), and multiplied that by the number of operations to get a size category estimate before subtracting from the state total.

In a few cases, the USDA did not disclose the size of any operations in the state (if there are too few or if the few that do exist are dispersed among many counties) and did not disclose the livestock totals in the state. For states where operational size was not disclosed, Food & Water Watch used the threshold figure for the largest size of operations (500 for beef and dairy cattle and 1,000 for hogs) for the counties with operations.

Poultry operation sizes were not disclosed for any county, and these averages are calculated by dividing the total number of broilers or layers by the total number of farms (see below).

Slaughterhouses and Processing Plants

The map also shows the county location of the slaughter facilities and poultry processing plants for the top four beef, pork and poultry processing companies in the United States. The top four companies and their locations were taken from industry sources (*Cattle Buyers Weekly*, the National Pork Board and *Watt PoultryUSA*).²⁸⁴ The displayed location on our Factory Farm Map reflects only the county where the facilities are located; it does not reflect the exact geographic location of the facility. In counties where there is more than one slaughter or processing facility, the map display represents an even distribution of facilities. Again, this does not reflect the exact location of the plants.

Cattle on Feed

Until 2002, the USDA did not separately report the number of beef cattle operations that finish cattle on feed, which distinguishes feedlots from younger cattle on cow-calf, backgrounder and stocker operations that pasture their cattle or those that are entirely grass-fed and do not spend any time on a feedlot. The inventory of “cattle on feed” was a new item in the 2002 *Census of Agriculture* and refers to cattle being fattened on feedlots with grain prior to slaughter. The map and analysis does not display data for 1997 for cattle on feed, and, as a consequence, it cannot report total animal units for 1997 because there is no comparable information.

Broilers and Layers

The USDA’s *Census of Agriculture* does not report the number of chickens by county, but it does report state totals for broilers and layers. For broiler and layer operations, Food & Water Watch divided the total number of birds in each state by the number of operations and attributed the state average to every operation in the state. This necessarily is a less precise average than for some other livestock average size figures, but it does reflect the average in that state.

For broiler operations, the USDA does not report the number of birds on the farm by size class; it only reports the annual sales of broiler operations by size class. The largest category of broiler operations sold at least 500,000 broiler chickens. To determine the average size of these operations, Food & Water Watch divided the total state number of broilers sold on the largest operations by 5.5 (the number of flocks of broilers sold annually by typical operations), which generates the statewide broiler inventory. The statewide broiler inventory was divided by the number of broiler operations to calculate the average broiler inventory.

- 1 Unless otherwise specified, all of the data in this report is taken from Food & Water Watch's analysis of the state- and county-level five-year *Census of Agriculture* data collected and published by the U.S. Department of Agriculture (USDA) National Agricultural Statistical Service (NASS). USDA NASS. 1997 *Census of Agriculture*. AC97A-A-51. March 1999; USDA NASS. 2002 *Census of Agriculture*. AC-02-A-51. June 2004; USDA NASS. 2007 *Census of Agriculture*. AC-07-A-51. February 2009, Updated December 2009; USDA NASS. 2012 *Census of Agriculture*. AC-12-A-51. May 2014. For more information on the source and analysis of this data, see the Methodology section at page 35.
- 2 The comparison for animal units only goes back to 2002, as the USDA did not collect inventory data on beef cattle feedlot operations prior to that. Inventory of "Cattle on feed," was a new item in 2002 and refers to cattle being fattened on feedlots with grain prior to slaughter, not cattle that were pastured only. See USDA NASS. 2002 *Census of Agriculture* at Appendix A at A-8; USDA NASS. 2007 *Census of Agriculture* at Appendix B at B-5.
- 3 Gollehon, Noelet al. USDA Economic Research Service (ERS). "Confined animal production and manure nutrients." AIB-771. June 2001 at 8.
- 4 U.S. Environmental Protection Agency (EPA). "Risk Assessment Evaluation for Concentrated Animal Feeding Operations." EPA/600/R-04/042. May 2004 at 9; USDA National Resources Conservation Service (NCRS). "Agricultural Waste Management Field Handbook." Chapter 4, Agricultural Waste Characteristics. March 2008 at 4-12 to 4-20; Dallas Cowboys. [Press release]. "Dallas Cowboys Stadium Design Statement." December 12, 2006.
- 5 Inventory of "Cattle on feed" was a new item in 2002 and refers to cattle being fattened on feedlots with grain prior to slaughter, not cattle that were pastured only. See 2002 *Census of Agriculture* at Appendix A at A-8 and *Census of Agriculture* at Appendix B at B-5.
- 6 The USDA NASS *Census of Agriculture* measures broiler operations only by annual sales, not by facility size. There are an average of 5.5 batches of broilers produced per year at any given facility, so facility size is estimated by dividing annual sales by 5.5.
- 7 USDA NASS. 2012 *Census of Agriculture*. United States Summary and State Data at Tables 11, 12 and 20; Food & Water Watch calculation comparing human and livestock waste production based on EPA (2004) at 9.
- 8 USDA NCRS (2008) at 4-12 to 4-20; Dallas Cowboys (2006).
- 9 Seely, Ron. "Who's watching the farm?" *Wisconsin State Journal*. February 28, 2010.
- 10 Martin, Timothy W. and Julie Jargon. "In empire of eggs, a dozen opinions." *Wall Street Journal*. August 27, 2010.
- 11 USDA NASS. 2012 *Census of Agriculture*. United States at Table 5 at 14.
- 12 Walt, Vivienne. "The World's Growing Food-Price Crisis." *Time*. February 27, 2008; Harris, Jeffrey, Chief Economist and John Fenton, Director of Market Surveillance. U.S. Commodity Futures Trading Commission. Testimony before the Subcommittee on General Farm Commodities and Risk Management, U.S. House Committee on Agriculture. May 15, 2008 at 8; Osnos, Evan and Laurie Goering, "World's giants to alter food equation." *Chicago Tribune*. May 11, 2008.
- 13 United Nations Conference on Trade and Development (UNCTAD). "The Global Economic Crisis: Systemic Failures and Multi-lateral Remedies." UNCTAD/GDS/2009/1. 2009 at 24.
- 14 USDA ERS. Commodity Costs and Returns. "U.S. corn production costs and returns per planted acre, 2005-2009, 2010-2013." October 4, 2014; USDA. "USDA long term projections." February 2015 at 57.
- 15 USDA (February 2015) at 64.
- 16 Huffstutter, P.J. "Pork prices hit 4-year low; growing herd, flat demand slam industry." *Reuters*. February 16, 2015; Montgomery, Jeff. "Region's poultry industry showing strength." *Wilmington News Journal*. January 10, 2015.
- 17 USDA NASS. 1997 *Census of Agriculture*. United States at Table 24 at 30; USDA NASS. 2012 *Census of Agriculture*. United States at Table 12 at 19; USDA NASS. Agricultural Statistics Database. "Milk—Production, Measured in Lb." Available at <http://www.nass.usda.gov/QuickStats>. Accessed March 2015; MacDonald, James M. and William D. McBride. USDA ERS. "The Transformation of U.S. Livestock Agriculture: Scale, Efficiency, and Risks." EIB-43. January 2009; Miller, James J. and Don P. Blayney. USDA ERS. "Dairy Backgrounder." LDP-M-145-01. July 2006 at 7.
- 18 Hendrickson, Mary, William D. Heffernan et al. Department of Rural Sociology, University of Missouri-Columbia. Report to the National Farmers Union. "Consolidation in Food Retailing and Dairy: Implications for Farmers and Consumers in a Global Food System." January 8, 2001 at 7.
- 19 Dean Foods. Fourth Quarter 2014 Earnings Call. February 10, 2015 at 4; Bunge, Jacob and Tess Stynes. "Dean Foods reports loss amid high dairy prices." *Wall Street Journal*. February 11, 2014.
- 20 Dean Foods. U.S. Securities and Exchange Commission. Form 10-K. Fiscal year ending December 31, 2014 at 4; Mintel Group. Food Market Report. "Dairy and Non-Dairy Milk – US." Figures 44 and 45. April 2012.
- 21 The data presented throughout this report are taken from Food & Water Watch's analysis of the USDA NASS's 1997, 2002, 2007 and 2012 *Census of Agriculture* reports and data. For more information on the source and analysis of this data, see the Methodology section at page 35.
- 22 Food & Water Watch calculation comparing human and livestock waste production based on EPA (2004) at 9. The average human produces 183 pounds of manure annually compared to 30,000 pounds for 1,000 pounds of live weight dairy cow (which is one dairy cow animal unit). Every dairy cow animal unit produces 163.9 times more manure than an average person. Food & Water Watch multiplied the number of dairy cow animal units on operations of over 500 cows in each county by 163.9 to come up with a human sewage equivalent. U.S. EPA reports that "A dairy CAFO with 1,000 animal units is equivalent to a city with 164,000 people," which means that one dairy animal unit is equivalent to 164 people, which matches Food & Water Watch's calculations. The human sewage equivalent was compared to the U.S. Census Bureau figures for metropolitan area population estimates. U.S. Census Bureau. "Annual Estimates of the Population of Metropolitan and Micropolitan Statistical Areas: April 1, 2000 to July 1, 2012." (CBSA-EST2012-01).
- 23 USDA. 2012 *Census of Agriculture*. United States at Table 12 at 19.
- 24 MacDonald and McBride (2009) at 12.
- 25 USDA. 2012 *Census of Agriculture*. United States at Table 13 at 19.

- 26 Inventory of "Cattle on feed" was a new item in 2002 and refers to cattle being fattened on feedlots with grain prior to slaughter, not cattle that were pastured only. See USDA NASS. 2002 *Census of Agriculture* at Appendix A at A-8 and 2007 *Census of Agriculture* at Appendix B at B-5.
- 27 Hegeman, Rozana. "Feedlots closing in wake of drought." *Associated Press*. March 2, 2013.
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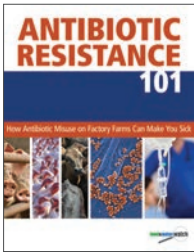
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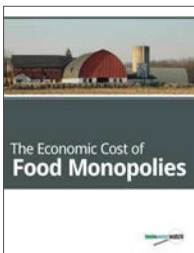
Antibiotic Resistance 101: How Antibiotic Misuse on Factory Farms Can Make You Sick

Every single day, factory farms are feeding their animals regular, low doses of antibiotics to prevent disease in filthy, crowded living conditions. This practice creates a perfect breeding ground for bacteria that are resistant to antibiotics. Antibiotic-resistant bacteria can spread from farm animals to humans via food, through animal-to-human transfer on farms and in rural areas, and through contaminated waste entering the environment. The Centers for Disease Control and Prevention estimates that at least 2 million Americans each year experience antibiotic-resistant infections, leading to at least 23,000 deaths.



Corporate Control in Animal Science Research

Corporate agribusinesses depend on favorable science to gain regulatory approval or market acceptance of products such as new animal drugs, and they depend on academic journals to deliver this science. To secure favorable scientific reviews, industry groups play an enormous role in the production of scientific literature, authoring journal articles, funding academic research and also serving as editors, sponsors or directors of scientific journals where much of their research is published. The influence that industry now wields over every aspect of the scientific discourse has allowed companies to commercialize potentially unsafe animal drugs with virtually no independent scrutiny.



The Economic Cost of Food Monopolies

The concentration of economic power in every segment of food and agriculture can harm both farmers and consumers. In the agriculture and food sector, the four largest companies controlled 82 percent of the beef packing industry, 85 percent of soybean processing, 63 percent of pork packing, and 53 percent of broiler chicken processing. The rising economic concentration has contributed to the decline in the number of farms and the increased size in the farms that remain. This report examines five case studies of agribusiness concentration: Iowa's hog industry; the milk processing and dairy farming in upstate New York; poultry production on Maryland's Eastern Shore; organic organic soybean farming and soymilk production; and the California processed fruit and vegetable industry.



Fact Sheet: Ractopamine

Ractopamine is a drug intended to make livestock grow faster, with leaner meat and less fat. The livestock demonstrate higher feed efficiency, which means that they produce more meat from the same amount of feed. Even better, in the view of meat companies, ractopamine has no obvious effects on the quality of the meat. But using ractopamine may pose human health risks and can compromise animal health and welfare, and its continued use in the United States hurts the agriculture industry as a whole because much of the world does not allow it.

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