



The Hidden Costs of CAFOs



Smart Choices for U.S. Food Production

Over the past several decades, U.S. food production has taken an unwise and costly turn. Until recently, food animals and crops were produced in close proximity, frequently on the same farm, in an integrated, self-sustaining way that often had benefits for farmers and society as a whole. But animal production has undergone a profound transformation that has disrupted this balanced system. Our choice of food and agriculture policies has promoted the rise of massive CAFOs (confined animal feeding operations) that crowd many thousands of animals closely together in a small space and separate them from crop farming. CAFOs have well-documented problems that come with high social and economic costs:

- Air and water pollution produced by unmanageable mountains and lagoons of manure

- Higher incidence of antibiotic-resistant bacteria that make human illnesses harder to treat
- Diminished quality of life in numerous rural communities
- Beef and dairy products that are less nutritious than they could be

Fortunately, the United States can make choices that will put production of abundant food on a practical and healthy track. The contrast between CAFOs and a more modern approach to raising cattle, described here as smart pasture operations (SPOs), is illustrated in the table below. SPOs take advantage of both new technologies and natural efficiencies to produce better food—without many of the costs and problems associated with CAFOs.



CAFOs vs. “Smart Pasture Operations” for Cattle

CAFOs	SPOs
• Massive (thousands of animals)	• Mid-size (hundreds of animals) or smaller
• Extremely crowded facilities	• Less crowded facilities
• Unhealthy conditions lead to excessive antibiotic use and drug-resistant bacteria	• Healthier conditions reduce antibiotic use
• Cattle eat a diet (feed corn and soy) they cannot digest properly	• Cattle eat their normal, digestible diet (vegetation such as grass)
• Feed is usually purchased and shipped to the site	• Low-cost feed is produced on site (in the form of pasture)
• Usually isolated from crop farming	• Integrated with crop farming
• Unmanageable concentrations of untreated manure create air, water pollution	• Manure is put to immediate use as fertilizer for crops and pasture, minimizing pollution





CAFOs CREATE PROBLEMS BY IGNORING AND WORKING AGAINST VARIOUS NATURAL SYSTEMS RANGING FROM SOIL ECOSYSTEMS TO ANIMAL DIGESTIVE SYSTEMS

Crowding in Hog CAFO

Animals in CAFOs are packed tightly together.

Photo credit: Courtesy of Farmsanctuary.com.

A SMARTER CHOICE

In general, CAFOs create problems by ignoring and working against various natural systems ranging from soil ecosystems to animal digestive systems. By contrast, the superior SPO approach gains cost and other advantages by working with natural systems. For example, although dairy SPOs produce somewhat less milk per cow than dairy CAFOs, the SPOs often earn more profit per cow and per farm.

SPOs are only one alternative to CAFOs; other approaches can be similarly efficient while minimizing negative impacts. For example, pigs raised in hoop barns (low-cost, easily assembled tunnel-shaped structures with natural straw bedding) are less crowded than in CAFOs, and their manure can be

profitably used as fertilizer. SPOs and other alternatives to CAFOs illustrate the kind of modern, sophisticated approach to animal agriculture that U.S. decision makers should encourage with their food-production policy choices.

In *CAFOs Uncovered: The Untold Costs of Confined Animal Feeding Operations*, the Union of Concerned Scientists examines these critical choices, including the policies that have encouraged the growth of CAFOs and imposed enormous costs on our society. This groundbreaking report evaluates, for the first time, the combined impact of several types of problems created by CAFOs, including the cost of taxpayer subsidies and direct and indirect costs to society (such as environmental and health damage) that amount to billions of dollars annually.

CAFOs Uncovered also discusses better options—more sophisticated and efficient alternatives for producing



Hog Hoop Barn

Hoop barns give pigs straw bedding material and room to move.

Photo credit: Courtesy of North Carolina State University.

affordable food—and offers policy recommendations that can begin to lead us toward a modern, healthy, and sustainable food system. The full report is available at http://www.ucsusa.org/food_and_agriculture/agriculture_impacts/cafos-uncovered.html.

CAFOs CREATE AVOIDABLE PROBLEMS

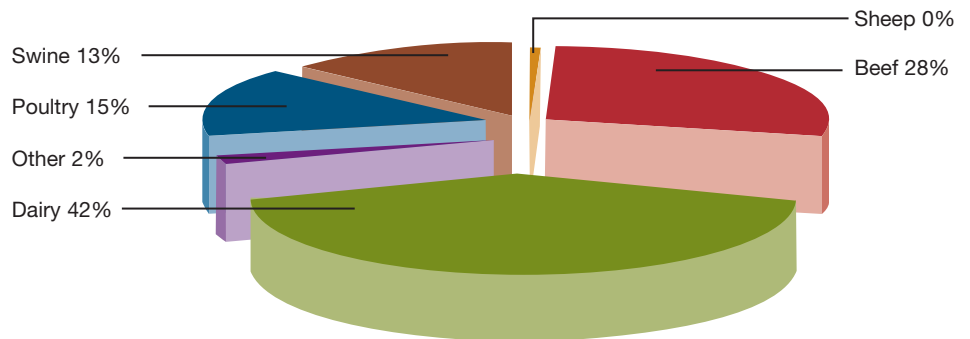
CAFOs can appear to operate efficiently because they have been allowed to shift costs onto society as a whole. These “externalized” costs—summarized below—hide CAFOs’ true inefficiency.

Taxpayer-subsidized feed grain enabled CAFOs to grow and dominate the market.

CAFOs have been indirectly supported by the federal farm bill, which authorizes huge taxpayer-funded subsidies for grain farmers. Until recently, these subsidies contributed to artificially low prices for corn, soybeans, and other grains, which enabled CAFOs to grow to extraordinary sizes. But some food animals are not well suited to an exclusive diet of feed grains. Cattle, for example, are healthiest when eating their natural diet of grass and forage; eating a grain diet for too long makes these animals sick. Moreover, grain-fed cattle can produce less nutritious beef and milk than their grass-fed counterparts, as UCS documented in the 2006 report *Greener Pastures* (available at http://www.ucsusa.org/food_and_agriculture/solutions/smart_pasture_operations/greener-pastures.html).

Federal Environmental Quality Incentive Program (EQIP) Funding for 2006

National FY2006 Confined Livestock Cost-Share Approved



SOURCE: National Resource Conservation Service 2007.

INDIRECT GRAIN SUBSIDIES TO CAFOs BETWEEN 1997 AND 2005 AMOUNTED TO ALMOST \$35 BILLION, OR NEARLY \$4 BILLION PER YEAR



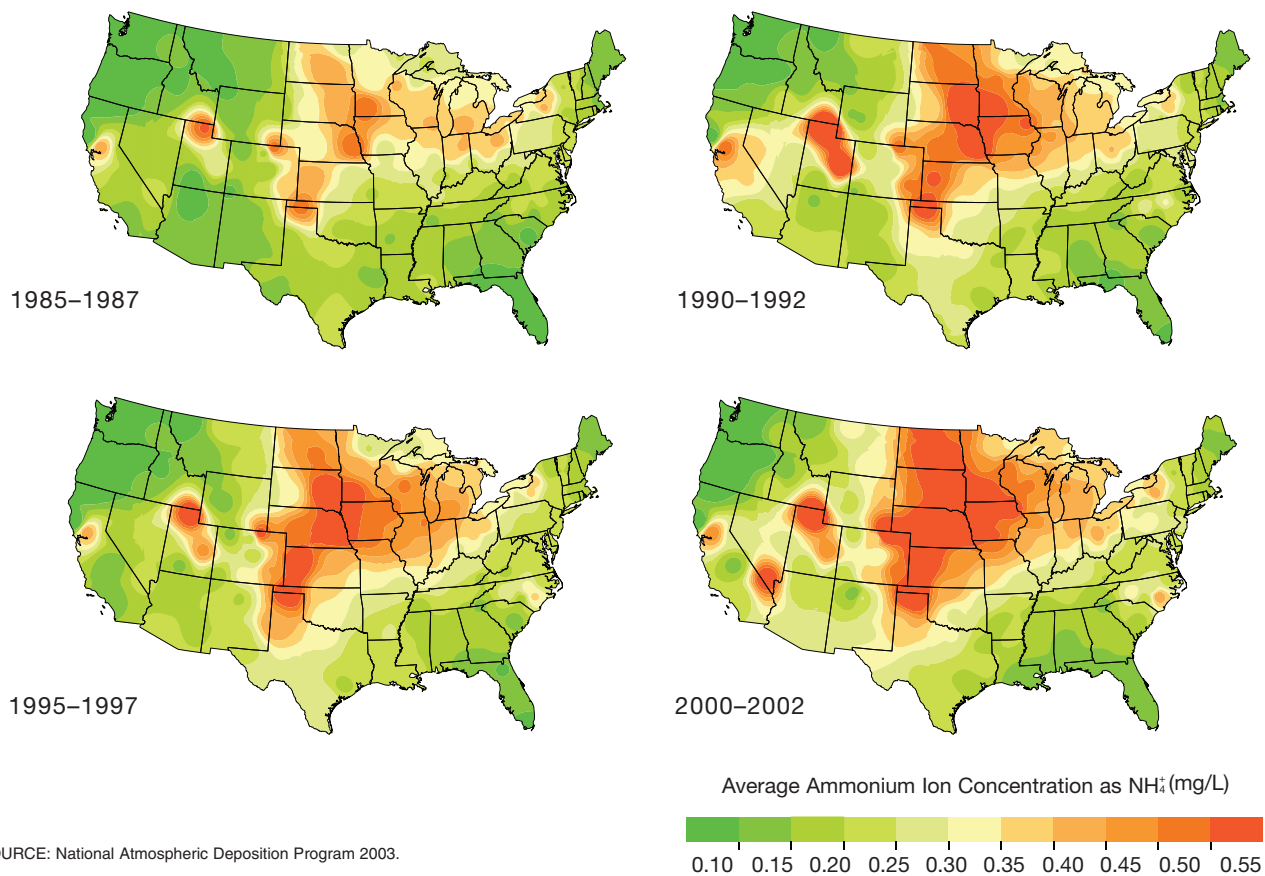
CAFO Manure Lagoon

Manure is flushed with water into a lagoon at this North Carolina hog CAFO.

Photo credit: Courtesy of USDA.

Average Atmospheric Ammonium Ion Concentration 1985-2002

CAFOs are a major contributor to increasing ammonia air pollution.



SOURCE: National Atmospheric Deposition Program 2003.

CAFOs have not benefited from this subsidy in recent years, when grain prices have been high. But the damage has been done: indirect grain subsidies to CAFOs between 1997 and 2005 amounted to almost \$35 billion, or nearly \$4 billion per year, serving to entrench the CAFO system.

Taxpayers pay to clean up CAFO waste—yet most CAFO pollution remains.

CAFOs produce some 300 million tons of untreated manure each year (about twice as much as is generated by the entire human population of the United States).

The disposal and cleanup cost for all of this manure would hobble CAFOs if they had to pay for it themselves. But another program authorized by the federal farm bill, the Environmental Quality Incentives Program (EQIP), subsidizes the cleanup of some CAFO waste.

THE COST TO CLEAN UP THE CONTAMINATED SOIL UNDER EVERY U.S. HOG AND DAIRY CAFO WOULD APPROACH \$4.1 BILLION

Extrapolation from the available data suggests that U.S. CAFOs may have benefited from about \$125 million in EQIP subsidies in 2007. Nevertheless, the program prevents only a small fraction of CAFO pollution (see below).

CAFOs create costly air and water pollution.

Even with EQIP subsidies, CAFOs do not effectively manage the enormous amounts of waste they produce. Manure is often handled, stored, and disposed of improperly, resulting in leakage, runoff, and spills of waste into surface and groundwater.

CAFO manure has contaminated drinking water in many rural areas, caused fish kills, and contributed to oxygen-depleted “dead zones” (areas devoid of valuable marine life) in the Gulf of Mexico, the Chesapeake Bay, and elsewhere. Ammonia in manure contributes to air pollution that causes respiratory disease and acid rain. Leakage under liquid manure storage “lagoons” pollutes groundwater with harmful nitrogen and pathogens, and some lagoons have even experienced catastrophic failures, sending tens of millions of gallons of untreated waste into streams and estuaries, killing millions of fish. Enforcement of environmental laws against polluting CAFOs has generally proven inadequate.

The total cost of CAFO pollution to human health and the environment is difficult to quantify, but we can get a sense of the magnitude by assessing some of the individual costs. For example, *CAFOs*



Environmental Damage from CAFOs

Flooding releases hog manure into rural waterways and wells.

Photo credit: Courtesy of Rick Dove, www.doveimaging.com and www.neuseriver.com.

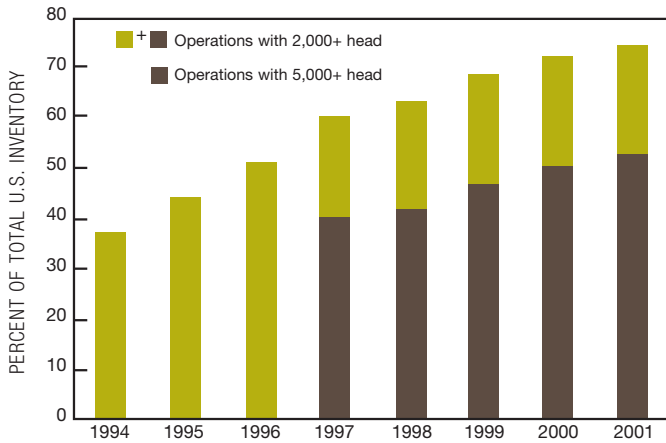


CAFO Manure Pile

This enormous pile of manure was CAFO-generated.

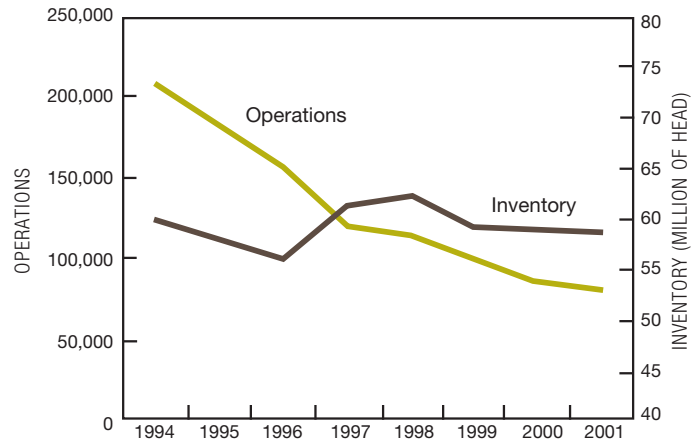
Photo credit: Courtesy of Factoryfarm.org.

U.S. Hog Inventory at CAFOs Has Increased Dramatically



Operations with 5,000+ head were not reported prior to 1996.
Source: McBride and Key, 2003, USDA, Economic Research Service, Report No. 818.

Total U.S. Hog Inventories Have Not Increased as CAFOs Replaced Smaller Farms



An operation is any place having one or more hogs on hand at any time during the year.
Source: McBride and Key, 2003, USDA, Economic Research Service, Report No. 818.

Uncovered estimates that the cost to clean up the contaminated soil under every U.S. hog and dairy CAFO would approach \$4.1 billion. In addition, the U.S. Department of Agriculture (USDA) has estimated that it would cost CAFOs at least \$1.16 billion per year to transport



Dead Fish

Fish killed by water pollution from CAFO manure.

Photo credit: Rick Dove, www.doveimaging.com and www.neuseriver.com.

and spread their manure on enough farmland to reduce both water and air pollution.

Antibiotic overuse at CAFOs creates drug-resistant bacteria and raises health care costs.

An estimated 70 percent of all antibiotics and related drugs used in the United States are given to food animals to promote faster growth and stave off diseases in highly crowded CAFOs. Often, these animals are given the same drugs used to treat human illness. This massive use of antibiotics in animals that are not sick contributes to the development of antibiotic-resistant bacteria such as *Salmonella*, various forms of *E. coli*, *Campylobacter*, and methicillin-resistant *Staphylococcus aureus* (MRSA). Illnesses caused by such

bacteria are often more difficult to treat, leading to longer and more costly hospital stays, additional lost work and school days, and more deaths.

The National Academy of Sciences has estimated that antibiotic resistance from all sources increases U.S. health care costs by at least \$4 billion annually. The total societal costs attributable to antibiotic use in animal agriculture are difficult to calculate, but are likely to add up to billions of dollars.

CAFOs harm rural communities.

CAFOs are sited in rural communities that bear the brunt of the harm caused by these operations, including water contaminated by nitrogen and pathogens, and higher rates of respiratory and other

diseases compared with other rural areas. These risks also depress property values in communities near CAFOs: based on data from Missouri, *CAFOs Uncovered* estimates that property values near U.S. CAFOs have fallen a total of about \$26 billion.

BETTER OPTIONS

CAFOs are not the only means of ensuring that the United States can produce sufficient quantities of food at a reasonable cost. In fact, there is a growing movement among U.S. farmers to improve efficiency by harnessing natural systems rather than working against them. More and more meat and dairy farmers are successfully adopting sophisticated animal production practices such as SPOs and hog hoop barns that avoid most of the costly and dangerous consequences of CAFOs.

“Just right:” employing the “Goldilocks principle.”

Bigger isn't always better, as mounting problems related to CAFOs illustrate. But tiny farms aren't the only alternative either. There is growing evidence that modern mid-size operations can compete with CAFOs, even when only the direct costs are taken into account. For example, recent studies by the USDA show that nearly 40 percent of mid-size animal feeding operations are about as cost-effective as the average large hog CAFO. These mid-size and smaller operations can also produce abundant animal

products. Evidence from pig CAFOs shows that the United States produced as many pigs in the past in smaller operations as it does now in CAFOs.

A range of scaled-down operations can utilize efficient production methods while avoiding the negative consequences of massive CAFOs. Mid-size hog hoop barns and pasture-based operations, for example, are just two approaches that fit this “just-right” category of alternatives. These operations are typically healthier for the animals and can often produce comparable or even higher profits per unit, at close to the same production costs. And when the hidden (or externalized) costs are considered, the comparisons clearly tilt in favor of these newer approaches.

Working with natural systems.

Managed intensive rotational grazing (MIRG) systems for cattle take advantage of low-cost grasses on well-managed pastures that require less maintenance, energy, pesticides, and water than the feed crops on which CAFOs rely. Healthy pastures are also less susceptible to erosion and absorb more of the nutrients applied to them, thereby contributing less water pollution. And manure, an unmanageable problem for CAFOs, is an asset in pasture-based and other alternative farming systems because it can be used to fertilize pasture vegetation or nearby crops. Such systems can and should replace CAFOs in the animal production landscape.



Alternative Cattle Production

Well-maintained pasture systems are efficient and safer for the environment than CAFOs.

Photo credit: Courtesy of SARE.

MANURE, AN UNMANAGEABLE PROBLEM FOR CAFOs, IS AN ASSET IN PASTURE-BASED FARMING SYSTEMS

NEW POLICIES, BETTER GROUNDED IN BOTH THE SCIENCE AND ECONOMICS OF ANIMAL AGRICULTURE, CAN LEAD US TO ABUNDANT FOOD AND EFFICIENT PRODUCTION PRACTICES THAT DO NOT CAUSE THE HARM ASSOCIATED WITH CAFOs

GETTING BACK ON TRACK: Using Policy to Promote Better Approaches

The price we pay as a society to support CAFOs is much too high. Though the costs estimated in *CAFOs Uncovered* are huge, a more comprehensive accounting would likely show the costs to be even higher—perhaps billions of dollars more per year. And the consequences for human health, the environment, and our quality of life are grave.

If CAFOs are not appreciably more efficient than small and mid-size farms, how have they managed to force many such farms out of the market? The answers lie largely in misguided, outdated government policies that have favored massive, stand-alone operations. Taxpayer-subsidized grain helped to entrench CAFOs with inexpensive feed, while weak pollution policies have allowed CAFOs to shift the burden of their mountains of waste onto the public. In addition, lax enforcement of antitrust laws has given too much power to the large meat and dairy processors that hold production contracts with CAFOs. As these large operations have grown even bigger, they have wielded a virtual monopoly over processing and market-

ing. In practice, this means that mid-size and small operations cannot easily get their animals slaughtered and to market.

New policies, better grounded in both the science and economics of animal agriculture, can lead us to abundant food and efficient production practices that do not cause the harm associated with CAFOs. The Union of Concerned Scientists supports policies that will force CAFOs to bear the full cost of the problems they create; level the playing field for smaller, more responsible producers; and encourage modern production practices. Specifically, we call on the U.S. government to:

- Eliminate the waste-management subsidies that CAFOs now receive under the federal EQIP program, and instead offer pollution-prevention assistance to small and mid-size farms
- Substantially increase funding for research on modernized animal

production practices that will be beneficial to the environment, public health, and rural communities

- Strictly enforce antitrust and anti-competitive practice laws that have been neglected, to prevent processors from undermining mid-size operations
- Revise slaughterhouse regulations to facilitate larger numbers of safe, smaller, geographically dispersed processors (in order to better serve small and mid-size animal producers)
- Vigorously enforce the Clean Water Act as it pertains to CAFOs, including improved oversight at the state level
- Strengthen regulation under the Clean Air Act to reduce emissions of ammonia and other air pollutants from CAFOs

The Union of Concerned Scientists is the leading science-based nonprofit organization working for a healthy environment and a safer world.



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