

By [Leslie Renken](#) of the Journal Star

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Odors from hog plants prompt health research, questions about regulation

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LAST OF THREE PARTS

PEORIA — The smell of manure has long been a part of country living. In the past, most farmers had a few pigs or cows producing odors that wafted around in the country breezes.

The industry has changed, though, in the last two decades. Many farmers have given up their small livestock operations and either left the business or built larger, more efficient production facilities. Today it's not unusual for livestock facilities to house thousands of animals, which, in turn, produce thousands of gallons of manure.

What hasn't changed is the fact that country breezes still blow the smell around, a smell that now is more concentrated.

Large animal feeding operations emit a number of substances with the potential to harm both human health and the environment, including ammonia, hydrogen sulfide, volatile organic chemicals, and particulate matter, according to a 2014 report compiled by the Congressional Research Service, a public policy research arm of the United States Congress.

A number of studies have documented a higher prevalence of respiratory problems in workers at confined animal facilities, including acute bronchitis, exacerbation of asthma, chronic bronchitis, mucous membrane irritation syndrome, and organic dust toxic syndrome, according to "The Respiratory Inflammatory Response to the Swine Confinement Building Environment" by researchers from University of Nebraska Medical Center. Studies also have documented increased respiratory complaints among the neighbors of confined animal feeding operations (CAFOs). Dr. Kendall Thu published several studies on the issue, the first in 1997, in which he looked at physical and psychological health data from 18 neighbors living within a two-mile radius of a 4,000-head swine facility in Iowa.

"We found that they experienced more dizziness, coughing and phlegm production, all symptoms consistent with respiratory irritation," said Thu, who is now the chairperson for the Department of Anthropology at Northern Illinois University. "The results were consistent with the symptoms experienced by people who work in those facilities, just not as intense." Children and people with pre-existing conditions are most at risk for problems, Thu said.

Emissions from CAFOs are relatively unregulated throughout most of the United States, in part because there still are many questions about how they contribute to air pollution, according to "Air Quality Issues and Animal Agriculture: A Primer."

To answer those questions, in 2005 the U.S. Environmental Protection Agency announced the Air Compliance Agreement plan to study emissions from different types of CAFOs around the U.S. Researchers from eight universities conducted a two-year, \$14.6 million study on emissions at 24 sites in nine states, according to information on the EPA's website. The EPA still is analyzing the data and has not yet finalized any of the emission factors.

In Illinois, odor control is addressed in the Livestock Management Facilities Act through required setbacks and tree barriers. CAFOs with more than 17,500 pigs larger than 55 pounds can't be built less than a half-mile to the closest home, or 1 mile from the nearest town. A tree barrier around the facility is planted to direct odor-carrying dust up into the atmosphere rather than directly to the neighbors.

Thu says neither the setbacks nor the trees are going to be sufficient for odor control at Sandy Creek Lane LLC's proposed 20,000-hog farrowing facility in rural Marshall County. The factory farm was granted tentative approval for construction by the Illinois Department of Agriculture in October.

"The tree barrier is a nice gesture, but it's more cosmetic than anything. It's too permeable," he said. "I'm not saying it won't do any good, but certainly when you get to a facility of this size, it's not going to solve the problem. For a facility that's got 20,000 hogs, I would say that a two-mile setback is probably best."

CAFOs in Illinois that emit large quantities of air pollution could be subject to regulation under the Clean Air Act, the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Emergency Planning and Community Right-to-Know Act, none of which were designed to regulate CAFOs. In reality, CAFO emissions in Illinois only get addressed when a neighbor sues, said Thu.

"A neighbor will call the (Illinois Environmental Protection Agency) and say 'I'm experiencing a horrible odor,' and the IEPA may or may not come out. The real way it's regulated, quite frankly, is through private nuisance suits, where residents keep a diary or log and then file suit."

Experts in the hog industry say that smell is less about a facility's size and more about the way it's run. Odors are carried outside of the facility by dust, so good housekeeping can go a long way, said Nic Anderson, business developer for the Illinois Livestock Development Group.

"After every production cycle, they'll come in and clean and disinfect, not only for the next group for biosecurity, but also to reduce dust and buildup," he said. "They will also inspect fans in that room to make sure they are clean and working properly." This happens about once a month, Anderson said.



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Curt Zehr, the owner of a medium sized swine CAFO in Tazewell County and the president of the Illinois Pork Producer's Association, grew up in a house less than 300 feet from the family's hog facility — the smell doesn't bother him. Zehr said larger facilities don't necessarily smell worse — it has more to do with how a facility is managed. "A lot of these bigger units go to tremendous lengths to control odors."

Another method to control dust in livestock facilities is to add oil to the animal's food.

"It makes it more palatable for the sow and it reduces dust," he said.

Many researchers have been working to develop products that mitigate smells endemic to animal production. It's a complicated process because every animal is different — what causes a hog farm to smell is different from what causes a chicken or cattle facility to smell. There also are variables caused by what the animal eats and the conditions they are living in. Terry Whitehead, a microbiologist for the U.S. Department of Agriculture in Peoria, has been working on odor reducing technology for 15 years. He and fellow microbiologist Mike Cotta created an odor-reducing enzyme specifically for hog manure using tannins from the South American quebracho tree.

"We tested it on swine manure and found that it really knocked out total gas production," he said. "The tannins shut down the bacteria producing the gas — there was less methane, and less hydrogen sulfide."

The pair have patented the product and hope it will soon be marketed, but production depends on demand, and Whitehead isn't sure farmers will be rushing to buy it.

"The pork industry is working with a really low profit margin right now," he said. "It's always a balancing game of economics."

Products such as Whitehead's cost money, and there are no laws requiring farmers to address odors with anything other than setbacks and trees. Nonetheless, many have experimented with odor-reducing products in an effort to improve neighborhood relations. Some have had success, some have not, said Anderson.

"We've seen thousands of additives, but we haven't found anything that works 100 percent of the time," he said.

PART ONE OF THREE PARTS: [Hog farm plans become a divisive issue in Marshall County.](#)

PART TWO OF THREE PARTS: [Concern about Big Sandy Creek drives group in its protest of hog farm.](#)

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Leslie Renken can be reached at 686-3250 or lrenken@pjstar.com. Follow her on Twitter, [@LeslieRenken](#), and subscribe to her on [Facebook.com/leslie.renken](https://www.facebook.com/leslie.renken).