

CAFO AIR POLLUTION FACTS

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The current industrial farm animal production (IFAP) system often poses unacceptable risks to public health, the environment, and the welfare of the animals themselves, according to an extensive two-and-a-half-year examination conducted by the Pew Commission on Industrial Farm Animal Production (PCIFAP), in a study released April 29, 2008. (www.ncifap.org/)

- **An Ohio study concluded that animal confinements should be sited with consideration of the location of human habitation and stated that the use of antibiotics should be reviewed to minimize the development of antibiotic resistant bacteria.** It discovered antibiotic resistant staphylococcal isolates in the air near swine barns. Air fungi identified included species of *Alternaria*, *Aspergillus*, *Monilia*, *Mucor*, *Penicillum*, and *Rhizopus*. ***Significant levels of staphylococci and fungi were found in nearby residences. In early summer, high numbers of aerosolized staphylococci at one test site constituted 54% of the total bacteria recovered downwind from the swine facility.*** (Scarpino, P. V. and Quinn, H., Bioaerosol Distribution Patterns adjacent to two swine growing finishing housed confinement units in the American Midwest. University of Cincinnati.)
- **In 2004, a follow-up study found resistant bacterial forms inside and downwind of swine confinement units.** The study concluded that inhalation of microorganisms could be a health concern for workers inside and downwind. The major conclusion was that bacteria found in this study and prior studies could cause a potential human health hazard. ***The study recommended that it is logical to place confinements in areas that do not have a large population nearby.*** (Gibbs, Shawn, et al. Airborne Resistant and Nonresistant Bacteria Recovered from Two Swine Herd Confined Animal Feeding Operations, *Journal of Occupational and Environmental Hygiene*, 11/04)
- **Additional Ohio follow up research published in 2006 found multidrug-resistant bacteria upwind and in higher concentrations downwind and within CAFOs even after subtherapeutic antibiotics were discontinued inside the CAFO. This could pose a potential health hazard for those who work within or live in close proximity to these facilities.** (*Environmental Health Perspectives* 114:1032–1037 (2006). doi:10.1289/ehp.8910 available at <http://dx.doi.org/> Accessed March 27, 2006)
- **Infant Health and CAFOs** Peer-reviewed research of pollution from livestock facilities on infant health found an increase in infant mortality. The results suggest that the mechanism by which this effect operates may be increased air pollution. The mortality increases are driven by elevated levels of respiratory diseases, providing suggestive evidence of an air pollution mechanism. (*American Journal of Agricultural Economics*, October 8, 2008. Wellesley MA.)
- **Johns Hopkins University researchers found airborne multidrug-resistant bacteria and antibiotics inside swine confinement operations. Regardless of bacterial species, 98% of the isolates expressed high-level resistance to at least two antibiotics commonly used in swine production. The study stressed that the high concentrations of pathogens and dust from animal waste could pose unique health concerns to people living near land application sites, and raised questions about the spread of drug-resistant bacteria beyond the immediate site through ventilation fans.** (*Environmental Health Perspectives*. Amy Chapin, et al. doi10.1289/ehp.7473 November 2004)
- **A National Academy of Sciences (NAS) study released in July 2002 concluded that airborne pollution from CAFOs is as much of a concern as the animal waste that ends up in our streams. The study made it clear that these pollutants from factory livestock facilities are a serious environmental and health concern.** The report, requested by the U.S. EPA and USDA, recommended that regulators find better ways of measuring airborne pollutants and the manner in which they are dispersed.

- **Public health scientists now recognize that hydrogen sulfide is a potent neurotoxin**, and that chronic exposure to even low ambient levels can cause irreversible damage to the brain and central nervous system. Children are among the most susceptible to this poison gas. (Journal of Environmental Science and Health B, 200003, 35: 2, 245-58)
- **People exposed to hydrogen sulfide at nuisance levels for prolonged periods showed chronic neurobehavioral impairment (loss of balance, memory, and reaction time) months to years afterwards.** (Southern Medical Journal, 1997)
- **The University of Iowa Air Quality Report concluded that “emissions may constitute a public health hazard,” and “precautions should be taken to minimize exposures arising from CAFOs.”** The report stated that hydrogen sulfide and ammonia measurements near livestock operations have been high enough to be harmful to humans and recommended new air quality standards for CAFOs. (Press Release, the University of Iowa, February 8, 2002. Debra Venzke, University of Iowa College of Public Health)
- **Even moderate occupational exposure and insidious environmental exposure to hydrogen sulfide can cause permanent impairment.** It is heavier than air, and can descend downwind. (Dr. Kaye Kilburn, University of Southern California School of Public Health)
- **Research suggests exposure to odor has an effect on secretory immune function and is particularly important in that it documents a physiologic effect among neighbors of industrial hog operations.** (Health Effects Associated with Exposure to Airborne Emissions from Industrial Hog Operations in Eastern North Carolina)
- **Increased Asthma Found among Iowa Children Living on Hog Farms.** University of Iowa College of Public Health has found that the prevalence of asthma is elevated among children living on farms where swine are raised. Children living on swine farms where antibiotics are added to feed have a significantly higher prevalence of the respiratory disease. (University of Iowa News Release, December 9 2004.)
- **A Health Department report found an increase in both diarrheal and respiratory illness cases in Milford Utah during the period from 1992 to 1998 when a 44,000 CAFO became operational.** (Keller H. & R. W. Ball. 2000. A Retrospective Study of Diarrheal and Respiratory Illness Incidence Rates in Milford, Utah 1992-1998. Salt Lake City, Utah: Bureau of Epidemiology, Utah Department of Public Health)
- **Air pollution from hog operations is emitted by barns, lagoons, pits, slurries, and land application.** Gases have been detected four miles downwind that are as intense as at a lagoon. Heavy accumulations occur most frequently between 6-8 a.m. and 7-9 p.m. Roof shingles, siding, fabrics, and other material can trap odors and release them when conditions are right. Workers can become desensitized because the molecules tie up their olfactory nerves. (Susan Schiffman, Duke University Swine Odor Task Force)
- **Particulate exposure elevates the incidence of respiratory symptoms and can increase the risk of respiratory and cardiovascular morbidity and increased hospital admissions or emergency room visits for asthma or other respiratory problems.** (Committee of the Environmental and Occupational Health Assembly of the American Thoracic Society, 1996)
- **A study of human health effects of living near industrial hog operations found that people living near large hog farms suffer significantly higher levels of upper respiratory and gastrointestinal ailments than people living near other farming areas.** (University of North Carolina, School of Public Health." *Kansas Rural Papers*, May 1999)
- **Other symptoms reported** from exposure to gases emitted by hog facilities "may elicit nausea, vomiting and headache; cause shallow breathing and coughing, upset stomach and loss of appetite,

irritated eyes, nose and throat; disturb; annoy; and depress" (Overcash, et al.,1984 (Understanding the Impacts of Large-Scale Swine Production, June 1996)

- **"Please be advised that the Agency has documented livestock waste related odor problems at distances far greater than one-quarter mile.** In fact, we have been involved with situations where offensive odors were reported detected two to three miles from swine production and/or waste handling facilities." (IEPA letter to Little Timber, L.L.C. hog facility in Illinois 10-10-96)
- **"Many of us still ignore the fact that wind direction and times of spreading are very important to neighbors... Odors can drain downhill a long distance, from three to five miles."** said Ted Funk, University of Illinois Extension Agriculture engineer specialist. (*IL.Agrinews*, September 17, 1998)
- **"Ammonia and hydrogen sulfide are tremendous intoxicants.** Ammonia can burn eyes and lungs. Dust can aggravate asthma. "Ammonia from the farm rises into the atmosphere, returning as rain. People have symptoms, legitimate symptoms. You can't deny them," states Kelley Donham, director of the University of Iowa's Center for Agricultural Safety and Health. (*Des Moines Register*, October 25, 1998)
- **"A Minnesota Pollution Control Agency study** using a computer model found that hydrogen sulfide levels could be expected as far as five miles downwind from confinement sites." (*Des Moines Register*, October 25, 1998)
- **Evidence suggests that bioaerosols (dander, feed, excreta, and bedding) are associated with microbial pathogens of swine. These "can be carried and spread on dust." "Contrary to odors, many gases are odorless and tasteless, making them benign since they are difficult to detect with the human nose."** Odor and gases are different, but both contribute to decreased quality of life of neighbors (Controlling Odor and Gaseous Emission Problems from Industrial Swine Facilities, Yale Environmental Protection Clinic, Spring 1998)
- **Hydrogen sulfide is considered to be an insidious poison** because our sense of smell rapidly fatigues, and therefore fails to provide a good warning of gas concentration." Symptoms include eye and upper respiratory irritation, headaches, and dizziness. Higher concentrations can cause "severe eye and respiratory tract irritation, acute conjunctivitis, lacrimation, and difficulty breathing, as well as a sudden loss of consciousness. (Safety Net, University of California, Davis, Environmental Health and Safety, 2-1993)
- **Unsolicited complaints from residents living next to a five-building swine CAFO had physical symptoms** as breathing difficulties, burning sensations in the nose and throat, nausea and vomiting, headaches, sleep problems, and others. (Michigan Department of Health)
- **Minnesota Pollution Control Agency (MPCA) data reveal that swine CAFOs can emit hydrogen sulfide onto neighboring property at levels that exceed World Health Organization recommended standards.** (Roth, 1993).
- **Residents living within two miles of a 4,000-head hog confinement reported significantly more respiratory problems than other residents.** (Institute for Rural and Environmental Health, University of Iowa, 1997)
- **Neighbors may experience: eye, nose, and throat irritation, headache, nausea, diarrhea, hoarseness, sore throat, cough, chest tightness, nasal congestion, heart palpitations, and shortness of breath, stress, drowsiness, and mood alterations when ambient air quality standards for livestock are exceeded.** (Minnesota Department of Public Health, 2001)
- **Residents in the vicinity of an approximately 6,000-head hog confinement** reported increased occurrences of headaches, runny nose, sore throat, excessive coughing, diarrhea, and burning eyes

as compared to residents of the community with no livestock operations. (School of Public Health, University of North Carolina, 1999)

- **Existing data provide evidence for potential adverse health effects due to hydrogen sulfide concentrations.** Property line monitoring data indicate that 43 violations in August posed a threat to human health (Minnesota Department of Public Health, 2000)
- **A USDA study suggests that aerial transfer of antibiotics and antibiotic-resistant bacteria from swine confinements may represent an important and previously overlooked mechanism for transfer of antibiotic resistance to humans and to the environment.** (J.A. Zahn, National Swine Research and Information Center, Ames, Iowa, July 2001)
- **Swine barns have the potential of generating more odor than manure storage facilities** such as lagoons and tanks, and could be the major odor sources causing downwind odor nuisance. (A field study on downwind odor transport from swine facilities AU Zhu J.;L X)
- **Dairy CAFOs produce dusts that may pose a greater risk than other types of dust.** The dust from dried dairy manure is *agricultural organic dust*, can contain microorganisms, endotoxins, and aero-allergens. Inhalation of these can lead to several disease conditions in humans. Dairies can create dust from increased traffic due to constant deliveries of milk and supplies on rural roads. Dairies are sources of hay and grain dust. (Dairy Herds and Rural Communities in Southern New Mexico," Stephen Arnold PhD. 9/09 (Environmental Health)
- **Short-term exposure in an environmental chamber to malodorous emissions from a swine house at levels expected downwind can induce clinically important symptoms in healthy human volunteers.** (Shiffman et al., Environmental Health Perspectives Vol. 1113 #5 May, 2005)
- **Like noise and other repetitive environmental stressors, malodors may be associated with acute blood pressure increases that could contribute to development of chronic hypertension.** We conducted a repeated-measures study of air pollution, stress, and blood pressure in neighbors of swine operations. Our findings that odor and hydrogen sulfide, but not PM, were associated with BP increases are consistent with a psycho-physiological mechanism. (Air pollution from industrial swine operations and blood pressure of neighboring residents. Wing, Steve; Horton, Rachel Avery; Rose, Kathryn M, Environmental Health Perspectives, January 2013)
- **Exposure to swine dust in a swine-confinement building induces an intense inflammatory reaction in the airways as assessed** A Larsson, A G Eklund, L O Hansson, B M Isaksson, and P O Malmberg. "Swine dust causes intense airways inflammation in healthy subjects." American Journal of Respiratory and Critical Care Medicine (Impact Factor: 11.99). 11/1994; 150(4):973-7. Source: [PubMed](#))
- **Research examining two decades of livestock production data finds a positive relationship between increased production at industrial farms and infant death rates in the counties where the farms reside.** The study reported in the February American Journal of Agricultural Economics implicates air pollution and infant mortality.
- **"Nearly 70% of swine confinement workers experience one or more symptoms of respiratory illness or irritation."** <http://www.cdc.gov/niosh/nasd/docs6/mn98016.html>
- **Findings support the hypothesized immunosuppressive effect of malodor on mucosal immunity and provide preliminary data useful in understanding health effects related to malodor from industrial hog farming operations.** (Schiffman, Avery, Wing, Marshall, Department of Epidemiology, School of Public Health, University of North Carolina Chapel Hill, North Carolina 27599-7435, USA. [Archives of Environmental Health An International Journal](#) 03/2004; 59(2):101-8. DOI: 10.3200/AEOH.59.2.101-108 [PubMed](#))