



Policy for Reducing Air Pollution in Iowa: Ammonia and Fine Particulate Matter (PM2.5) from Concentrated Animal Feeding Operations (CAFOs)

Ammonia (NH₃) forms from the breakdown of manure and urine, as well as wasted animal feed. Ammonia becomes volatilized and blown downwind. Ammonia is a precursor to fine particulate matter (PM 2.5), meaning that ammonia will combine with other air-borne chemicals and particles to become fine particulate matter. According to the report “Ammonia Emissions from Animal Feeding Operations” by Arogo, et al, “...[A]gricultural activities, livestock production in particular, have been reported to be the largest contributor of NH₃ emissions into the atmosphere.”

Fine particulate matter causes haze in the air, triggers health problems and pollutes water bodies when it falls to the earth.

In Iowa, the livestock industry has been overtaken by CAFOs which are industry-sized animal factories. The largest of the CAFO buildings house thousands of pigs, chickens or dairy animals. They generate enormous quantities of manure that are stored in a manure receptacle beside the building or in a pit underneath the building. None of the manure is run through sewage treatment processes like human sewage.



The livestock production areas are producing ammonia 24 hours a day, 365 days a year, including cold weather and winter months when the highest levels of fine particulates occur, as long as there are animals and/or manure on-site in the production area – the buildings, the animals, the area around the buildings and the manure storage receptacle. The spread fields are also a source of ammonia, particularly after the manure has been applied to the land.

Current regulations on set-backs and siting requirements are not proper controls for reducing ammonia emissions and fine particulate matter. Siting of a CAFO does not reduce the number of molecules of ammonia or particulate matter that are produced. The siting distances were created in response to water quality and management issues as well as to avoid complaints from neighbors.

Techniques that reduce ammonia can also reduce the odor emanated from CAFOs. Likewise, techniques that reduce odor can also reduce ammonia. However, the odor and ammonia are not one in the same.

What are the health consequences?

Exposure to ammonia causes nose and throat irritations, irritates eye tissue and triggers respiratory problems. Exposure to large quantities of ammonia can cause death.

Because fine particulate matter is so small, it can easily be drawn into the lungs and transported into the bloodstream, leading to health consequences. Particulate matter can also irritate your eyes, nose and throat. People with heart disease, asthma or other lung disease are at increased risk from particulate matter exposure. Exercising will increase the risk from particulate matter since air is drawn more deeply into the lungs and breathing is faster.

Status of Iowa's Air Quality

The federal Clean Air Act was passed to ensure the citizens of the United States that the air is free from harmful pollutants. Under the federal Clean Air Act, the U. S. Environmental Protection Agency has set levels for particulate matter so that human health can be protected. The Iowa Department of Natural Resources is responsible for developing industry permits so that appropriate levels of particulates are maintained, to monitor the air quality across the state and to enforce compliance with permits. However, concentrated animal feeding operations (CAFOs), which are large, industrial-scale animal factories, are currently exempt from the federal regulations.

Several regions of the state have high background levels of particulate matter. These include Johnson County, Dubuque County, Scott County, and Muscatine County.

Policy recommendations

One of the rallying cries from the advocates for CAFOs is that rules and regulations should be voluntary. They often claim that the industry is so diverse in location, types of animals raised and methods used in housing and raising the animals, plus the industry is made of so many different kinds of business structures, that it is impossible to regulate the CAFO industry. The Iowa Chapter disagrees. The largest contributor of ammonia emissions is livestock operations. The largest farming operations involving livestock are concentrated animal feeding operations, confined in both buildings and open feedlots.

Furthermore, other industries in the state of Iowa must comply with permit limitations on the pollutants they are allowed to release in the air. Other industries are diverse in size, type of operation, type of products, types of pollutants and business structure. To be consistent and fair, all businesses, including CAFOs, need to be regulated for air pollution.

Iowa State University and the University of Iowa Study Group released "Iowa Concentrated Animal Feeding Operations Air Quality Study Final Report" in February, 2002, that clearly laid out maximum ammonia emissions that should be allowed for a CAFO. Those regulations need to be implemented now.

The Iowa Chapter believes that any policy regarding the reduction of ammonia must be enforceable. Members of the public should not suffer the consequences of the pollution created by CAFO's in the form of more expensive medical care and polluted water when the particulate matter is deposited on the earth.

The Iowa Chapter supports the following policies for reducing ammonia and PM2.5 emissions from CAFO's.

- Iowa State University Extension compiled a list of practices to reduce ammonia emissions. The Iowa Chapter supports having the Extension staff review the document "Practices to Reduce Ammonia Emissions from Livestock Operations" and update it, if new techniques for reducing ammonia have become available.
- No further studies are required to measure odor formed by CAFOs. The Iowa Chapter does not support delaying any rules or laws related to ammonia and odor because odor studies have not been completed.
- The Iowa legislature shall enact a law that ammonia shall not exceed 500 ppb for a one-hour time-weighted average (TWA), measured at the property line, that concentration at a residence or public use area should not exceed 150 ppb for a one-hour TWA, and that each CAFO be allowed up to seven days each calendar year when they are allowed to exceed the concentration for ammonia. These recommendations are based on the "Iowa Concentrated Animal Feeding Operations Air Quality Study Final Report," written by Iowa State University and the University of Iowa Study Group in February 2002.
- The Iowa Legislature shall enact a law that requires CAFO owners to alert within 48 hours any resident who lives within one mile of the CAFO, the spread fields or the roads used to haul manure to the spread fields that there will be movement of manure from the production area to the spread fields.
- Any CAFO over 500 animal units should be required to install a monitor for ammonia and fine particulate matter. Using Iowa Code § 459, Animal Agriculture Compliance Act, 500 animal units are:

Category of Animal	Number of animals in 500 animal units
Slaughter or feeder cattle	500
Immature dairy cattle	500
Mature dairy cattle	357
Butcher or breeding swine weighing more than 55 pounds	1,250
Swine weighing more than 15 pounds but not more than 55 pounds	5,000
Sheep or lambs	5,000
Horses	250
Turkeys weighing 112 ounces or more	27,778
Turkeys weighing less than 112 ounces	58,824
Chickens weighing 48 ounces or more	50,000
Chickens weighing less than 48 ounces	200,000

- Any CAFO that exceeds the level of ammonia that is protective of human health must implement techniques that will lower the level of ammonia.

- The Iowa Department of Natural Resources shall implement a call line where people can file complaints of CAFOs emitting levels of ammonia greater than those that protect public health. The Iowa Department of Natural Resources (DNR) shall review the monitor readings and determine if enforcement actions are needed. Adequate funds need to be made available to the DNR to perform enforcements. The DNR should have the ability to force a CAFO owner to reduce the number of animals being raised in the CAFO.
- State law should allow local control of the siting of CAFOs that would allow the Boards of Supervisors and the local community to zone CAFOs just like other industries, commercial activities and housing are zoned.

Sources

“Ammonia Emissions from Animal Feeding Operations”, by J. Arogo, P. W. Westerman, A. J. Heber, W. P. Robarge, and J. J. Classen, North Carolina State University,

“Concentrated Animal Feedlot Operations (CAFOs) Chemicals Associated with Air Emissions”, Prepared by the CAFO Subcommittee of the Michigan Department of Environmental Quality Toxics Steering Group, May 10, 2006

“Iowa Concentrated Animal Feeding Operations Air Quality Study Final Report”, Iowa State University and the University of Iowa Study Group, February, 2002

Iowa Department of Natural Resources web site, www.iowadnr.gov/air/index.html

Iowa Code § 459, Animal Agriculture Compliance Act

“PM 2.5 Chemistry and Episodes”, Power Point slides by Dr. Charles Stanier, University of Iowa, available at www.iowadnr.gov/air/index.html

“PM2.5 Basics”, Power Point slides by Jim McGraw, Iowa DNR, available at www.iowadnr.gov/air/index.html

“Practices to Reduce Ammonia Emissions from Livestock Operations”, Iowa State University Extension, July, 2004

“Results of the Iowa DNR Animal Feeding Operations Odor Study”, Iowa DNR Ambient Air Monitoring Group, January, 2006

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