

Air Quality and Livestock Facilities

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Air quality has moved to the forefront of environmental issues facing Wisconsin livestock producers. At issue are ammonia, hydrogen sulfide and odor generated from livestock facilities. Producers may soon be faced with regulatory pressure to manage livestock facilities and feedlots to comply with air quality standards.

Ammonia is emitted from livestock housing facilities, manure storage areas, and manure/fertilizer application areas. Ammonia (N gas) that is emitted to the atmosphere from agricultural areas either remains in the air as particulate haze or gets re-deposited back to land and water. Ammonia emission concerns include atmospheric particulates that cause haze and stimulate human respiratory health issues; and ecosystem N fertilization where re-deposited N from the air causes plant species to shift from native to grassy, causes soil acidification, and adds extra N in to the Mississippi River/Gulf of Mexico surface water system where a hypoxia zone has developed.

Hydrogen sulfide is a product of anaerobic decomposition of organic matter. Liquid livestock manure storage areas generate hydrogen sulfide. Hydrogen sulfide is toxic and causes human and animal health concerns. Periodically, farm workers are overcome by manure pit gas and die as a result of hydrogen sulfide.

Odor from livestock facilities arises from a mixture of different gases, existing at low concentrations. The actual odor can be from any combination of manure, dust, decaying feed, and other material. Many livestock facilities odors are identified as negative by the surrounding community.

In June of 2004, the UW-Discovery Farms Program coordinated air quality monitoring on a swine farm near Elk Mound, WI. This was a cooperative effort with technical monitoring conducted by Baumgartner Environics, Olivia, MN; WI DNR; and UW-Discovery Farms staff.

Air quality measurements and samples were gathered from 5 finishing barns at 3 property locations. Barns were total confinement with mechanical ventilation and manure storage pits below slotted feeding floors. Animal management within barns is “all in—all out”, where feeder pigs are brought in at 50 lbs. and finished to 250 lbs. in 16 week cycles.

This project, conducted in mid June, represents a 2 day snapshot in time of emissions generated from 1 farm. Results indicated that the hog barns were not a significant public health concern with regard to hydrogen sulfide and ammonia emissions on the monitoring day. Detectable gas concentrations and odor intensities were limited to the immediate vicinity of barns. The evaluation also indicated a potential for detectable, yet non-

annoying odors at property lines for two barns and at two nearest neighbor locations.

This project has helped raise awareness of livestock facility impact on air quality and helps set the stage for future research and education. Further on-farm air quality research is needed to better understand the impact of Wisconsin dairy, swine, beef and poultry housing facilities on local and regional air quality. Minimizing livestock facility impact on air quality will benefit public health, the environment, and improve public perception of livestock agriculture

For additional project information see:

<http://www.discoveryfarms.org/corefarms/Harrison/report.pdf>

<http://www.soils.wisc.edu/extension/wfapmc/2005/ppt/Klingberg.pdf>