Mountains of Manure

The USDA estimates that more than 335 million tons of manure are produced annually on U.S. farms. Stored for long periods of time in giant tanks or lagoons, the animal waste decomposes and pollutes the air with hundreds of different gases. These storage facilities expose the livestock and the people who work with them to harmful gases. Spraying stored manure onto fields causes additional air pollution.

Hydrogen sulfide, methane, ammonia, and carbon dioxide are the major hazardous gases produced by decomposing manure. Methane emissions from manure increased by 26 percent in the United States between 1990 and 2004, due to larger, more concentrated dairy cow and swine facilities. North Carolina’s hog industry alone produces about 300 tons of ammonia each day.

Air Pollution and Feed

While manure is the largest contributor to air pollution from factory farms, industrial animal feed also plays a role. In 2004, the EPA estimated that 20 percent of all man-made methane production resulted from livestock digestion, primarily cows, which are kept alive in confinement with low-quality grain-based feed that their bodies were not designed to digest. Producing the vast crops required for this animal feed also pollutes the air with the use of synthetic fertilizers, which were responsible for 68 percent of all nitrous oxide released into the atmosphere in 2004.

Major Pollutants

Some of the principle air pollutants created by industrial livestock facilities are listed here, along with their effects.

- **Hydrogen Sulfide** is a gas associated with hog production facilities that can cause skin, eye, and respiratory irritation, neurologic and cardiac disorders, seizures, comas, and death. Chronic exposure at lower levels can cause low blood pressure, headache, chronic cough, and psychological disorders.
- **Ammonia**, which is associated with chicken and hog CAFOs, can cause irritation of the eyes, skin, and respiratory tract.
- **Particulate matter** is a leading cause of bronchitis and asthma, and can cause cardiac disorders including arrhythmia and heart attacks.
- **Endotoxins**, poisons produced by dying bacteria, are found in high concentrations on factory farms and cause respiratory problems even in low concentrations.
- **Carbon dioxide** is a byproduct of decomposing manure that causes shortness of breath and dizziness in humans, and often kills confined animals by asphyxiation.
- **Methane** is 23 times as potent as carbon dioxide and is the second most important contributor to the greenhouse effect - accounting for 16 percent of global greenhouse gas emissions from human activity.

Effects on Workers

As many as 70 percent of workers on CAFOs experience acute bronchitis, as well as a host of other respiratory ailments, and 25 percent contract chronic bronchitis. In the United States, at least 12 cases were documented over five years of workers dying from asphyxiation in manure pits.

Effects on Communities

Residents of communities near hog farms often have increased respiratory problems, fatigue, depression, and (continued)
mood disturbances. A study of one town in Utah found a four-fold increase in diarrhea-related hospitalizations and a three-fold increase in respiratory-related hospitalizations over a five-year period. A 2006 study comparing two rural Iowa elementary schools found a significant prevalence of asthma in children at the school near the factory farm.

ENVIRONMENTAL EFFECTS
Air pollution from farms directly affects the environment, chiefly through the production of gaseous nitrogen and some of the greenhouse gases responsible for global warming. About 80 percent of U.S. ammonia emissions came from livestock manure, affecting atmospheric visibility, soil and stream acidity, forest productivity, biodiversity, and coastal productivity. The agricultural industry was directly responsible for six percent of the U.S. contribution to global warming in 2004.

REMEDIES AND REGULATIONS
A number of techniques can reduce the emissions and effects of air pollutant from industrial farms, including better storage of manure, air-breaks positioned near farms, and increased attention to the nutritional needs of specific types of livestock. Raising animals on pasture also reduces the need for cultivation and transportation of feed, as well as storage and spreading of manure, all of which require the use of fossil fuels and result in the emission of large amounts of carbon dioxide and other pollutants.

There is little regulatory incentive to reduce pollution from factory farms. While most pollutants emitted by farms are regulated under the federal Clean Air Act, federal enforcement is focused on cars and non-farm factories, and it is largely left to the states to police factory farms. A 2008 rule exempted CAFOs from federal reporting requirements for hazardous emissions.

DID YOU KNOW?
- The odor from swine manure contains 331 separate chemical compounds.
- Tyson Foods recently agreed to pay an undisclosed sum in compensation for air-quality damage to residents near one of its Kentucky operations.
- Four couples in Iowa also reached settlement in 2003 with a large hog operation related to excessive odors, flies, and toxic gas emissions.
- A study in Sampson County, North Carolina indicated that ammonia concentrations in rainwater doubled between 1985 and 1996—a period during which hog operations in the state expanded rapidly.

What You Can Do...
- The most efficient way to reduce air pollution from farms is to reduce the size and increase the number of farms. As consumers, we can support this change by purchasing sustainably-produced meat, eggs, dairy products and produce, thereby supporting farmers who work to minimize harm to the environment and human health.

Visit the Eat Well Guide to find out where to buy sustainably produced food.

Find more detailed information about air pollution on our website at www.sustainabletable.org/issues/airpollution.