MANURE GASES

COMMONLY ASKED QUESTIONS

Manure gases are some of the most common toxic gases in a farm environment. Here are the answers to some of the most commonly asked questions about these substances.

National Farm Medicine Center

WHAT IS MANURE GAS?

Manure gas is actually a name used for several different gases formed by decomposition of manure. The gases of most concern are ammonia and hydrogen sulfide. Other gases of concern include methane and carbon dioxide. In certain concentrations, all of these gases are toxic to animals and humans.

WHEN AND WHERE ARE MANURE GASES PRESENT?

Since most of these gases in particular hydrogen sulfide are heavier-than-air, they tend to settle in low areas of manure storage or accumulation. Ammonia, which is lighter than air, is found above and around manure storage areas. Gas levels are generally very high at the time of agitation and in cases where ventilating systems are failing or inadequate. But, on calm, hot humid days, even a relatively empty manure pit may have high concentrations of toxic gases or may be lacking in oxygen. Always assume that the gases are present in storage areas.

WHAT IF A MANURE PIT NEEDS TO BE ENTERED?

Never enter a pit unless you have specialized training and equipment. Disposable dust respirators and chemical cartridges are not adequate protection to safely enter a manure storage area if the concentration of hydrogen sulfide and oxygen is not known. If you don't have specific training in confined space entry, get the help of your local fire department or emergency trainers before anyone enters the storage area. These individuals will be properly trained to use a self-contained breathing apparatus (SCBA). They will know how to use a safety line and harness with retrieval equipment, and will work with two other people outside the pit who are prepared for a safe rescue.

This advice is also critical for you if you come upon a situation where someone has been overcome by manure gases. There have been too many tragic stories of multiple deaths because a family member, neighbor or coworker attempted to rescue someone who had lost consciousness in a confined space. If you are faced with this situation call your local rescue squad, tell them about the victim, and do not attempt a rescue yourself.

No one should enter a manure pit or lagoon without a SCBA or first inspecting the gas levels with a detector tube attached to an air pump to check hydrogen sulfide levels or preferably a reusable continuous reading electronic meter to monitor oxygen and hydrogen sulfide. An environmental testing firm or university extension safety specialists can be contacted for recommendations on specific equipment and costs.

WHY ARE MANURE GASES DANGEROUS?

In some situations, gases can displace enough of the oxygen in an environment so that a person entering the area is asphyxiated, leading to death. High concentrations of hydrogen sulfide can cause sudden loss of consciousness without warning. In other cases, the gases can lead to toxic effects that make a person very ill and can cause long term health problems. The real danger is that it is impossible to evaluate your risk just by looking at a situation. Manure gases are invisible – and deadly.

WHAT ARE SOME OTHER TIPS TO AVOID EXPOSURE TO MANURE GASES?

- Remove all people and if possible, all animals from buildings over pits before pit agitation.
- Provide maximum ventilation when agitating or pumping manure.
- Do not smoke or have fire or ignition sources around manure pits.
- Do not fill manure pits to capacity - leave one to two feet of air space.

REFERENCES:

Donham KJ and Thelin A.
Agricultural medicine: occupational and environmental health for the health professions.
Ames: Blackwell Publishing, 2006.

Doss HJ, Person HL and McLeod W.
"Beware of manure pit hazards." NASD. April 2002.
National Ag Safety Database. 10 August 2009.
http://www.nasdonline.org/menu/topic/manure.html

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