

It's the Pits

Pit Gas Series #1: Hydrogen Sulfide

As a manure system decomposes, it emits many different kinds of gases. The most harmful are hydrogen sulfide, methane, ammonia and carbon dioxide. Research shows that chronic exposure to these gases, even at low levels, can significantly reduce animal productivity and health. Furthermore, elevated concentration levels can potentially cause fatalities for both humans and animals. In order to provide a more in-depth view, ProfitPro will address these gases in series of newsletters.

Pit Gases: HYDROGEN SULFIDE

Hydrogen sulfide is hazardous because it reaches toxic levels rapidly during agitation. The levels of hydrogen sulfide can rise from 5 parts per million (ppm) to more than 500 ppm in seconds. When concentration levels rise above 600 ppm, it can be fatal for a person or animal after only one or two breaths. In this situation, a person will immediately fall to the ground and remain unconscious until death.

On a lesser level, lower amounts of hydrogen sulfide may cause severe illness, respiratory and eye issues. Other symptoms include nausea, stomach discomfort, belching, coughing, headache and dizziness.

Another dangerous aspect is that hydrogen sulfide is heavier than air so it accumulates above the liquid level of the pit. Therefore, animals or humans that walk near the pit can be negatively impacted.

Pump-out Precautions

Unfortunately, a majority of the fatalities (humans or animals) occur when producers are pumping out their pits. Regardless of the timing, everyone involved with the pit must presume that the manure storage area contains hazardous gases. Protective systems must be employed and followed to minimize the risk for those working around the pits.



Because of the proximity of the manure, toxic gases are usually detectable in low levels throughout the year. However, when producers use agitation for pumping, the rapid releasing gas from the manure increases the risk for livestock and humans.

Table 1. Acute Effects of Swine Confinement Air Contaminants on Humans

| Gas | Exposure Level | Effect or Symptom |
|------------------|------------------------|---|
| Hydrogen Sulfide | 5 ppm | RECOMMENDED MAXIMUM FOR HUMAN HEALTH |
| | 10 ppm | Eye irritation |
| | 20 ppm for >20 minutes | Irritation to the eyes, nose and throat |
| | 50 to 100 ppm | Vomiting, nausea, diarrhea |
| | 200 ppm | Dizziness, nervous system depression, increased susceptibility to pneumonia, fluid in the lungs with prolonged exposure |
| | 500 ppm for 30 minutes | Nausea, excitement, unconsciousness |
| | 600 ppm and above | Rapid death |

Source: <http://nasdonline.org/document/1298/d001097/beware-of-manure-pit-hazards.html>

Solution

ProfitPro® has a number of ways, as part of its Full-Circle Animal, Manure, and Soil-Plant System™, to remediate noxious manure gases. The technologies available, to be used alone or in combination, include probiotic feed additive, (swine, dairy, beef), water additive (WaterRite™) and manure bioaugmentation products. ProfitPro offers a **Manure Management Service** that monitors and adjustments treatment applications to achieve optimal results. Products are also available for individual application.

For more information on ProfitPro's **Manure Management Service** call 1-888-875-2425 or go to www.profitproag.com.

Question & Answer

Is it safe to enter a hog barn if you can't detect the "rotten egg smell?"

Many hog producers believe that buildings are safe to enter if the rotten egg odor is not noticeable. However, this might not always hold true because when hydrogen sulfide reaches a certain level, it paralyzes the nerve cells of the nose, which essentially neutralizes the ability to smell odor.

Use a gas detector to determine what levels are. We found one at www.allgasdetectors.com/products/hydrogen-sulfide-detector-177613.shtml, but there are many others available as well.

Dr. Jim Ladlie will be one of the speakers on the **FREE Manure Management Teleconference** scheduled for **June 2, 2011** from 8 to 9 pm CDT on

"Danger of Pit Gases and

How to Effectively Manage Them"

For more information, go to manure.profitproag.com. Dial the toll free number 1-866-225-3498 just before 8 p.m. (CDT) and enter the security code 7159 # (pound key).