

Controls to reduce hydrogen sulphide in swine barns

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Previous studies have shown that a serious hazard in swine buildings is the presence of hydrogen sulphide (H₂S) in the manure. Hydrogen sulphide forms in the manure pit by anaerobic degradation, and as long as the manure is not agitated most of the H₂S produced remains dissolved in the liquid manure. When barn workers perform manure-handling tasks, such as pulling manure pit plugs, they can be at a high risk for exposure to H₂S that is released from the agitated manure.

The goal for this project is to develop and study control methods that may be implemented in current swine barns to reduce H₂S levels during manure handling practices. Three control methods are investigated, including 1) a remote plug pulling system; 2) water-based sprinkling in the manure pits; and 3) use of a manure scraper.

The remote plug pulling system consists of a winch outside the swine room that pulls a cable connected to the manure plug, allowing the worker to pull the plug from outside the room. To date, the design works well and effectively reduces the worker's exposure to H₂S. The water-based sprinkling system has shown to reduce the maximum levels of H₂S by up to 79%, depending on the nozzle type, water characteristics and flowrates. The manure scraper aspect will be studied in the winter of 2004.

Implications:

Three H₂S control systems that can be retrofitted into an existing barns under liquid manure management were investigated. A system that pulls the manure plugs from outside the swine room is effective at reducing worker exposure to H₂S, as is sprinkling a water-based solution over the H₂S gas emitted from agitated manure.