Draeger microPac Performance for Hydrogen Sulphide Monitoring in Commercial Swine Operations

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Summary

The swine industry needs reliable and affordable tools to monitor the air quality in the barn to ensure workers are fully aware of unsafe conditions. Sixteen Draeger microPac hydrogen sulfide (H_2S) monitors were followed over a year to determine the performance of the monitors. The monitors performed consistently under barn conditions with only a small average drift in the accuracy from 0.6 to 2.0 ppm. With a calibration every year, the Draeger microPac monitors are suitable for H_2S monitoring in swine barns.

Introduction

Until recently, systematic H₂S monitoring was not performed in the swine industry. A few incidents involving the detrimental effects of H₂S have increased the awareness of the possible hazards related to H2S and more intensive swine operators want to ensure that their workers are provided with equipment to warn them of unsafe working environments. Monitors in swine buildings are subjected to a harsh environment where dust, humidity and gases may be present and the monitors may be subject to accidental falls on the concrete or in the manure. As a result, the swine production conditions are likely to challenge the H2S monitor in a way the monitors have not previously experienced. The objective of this project was to evaluate the performance of the Draeger microPac unit (Figure 1) for H₂S monitoring in pig barns.

Experimental Procedures

Over the course of a year, four Draeger microPac monitors were used in office conditions as controls, and 12 monitors were used in both the PSC Floral and Elstow barns. The working conditions for each monitor that were in the barns was similar, including power washing and pit pulling. Eight of the monitors used in the barns were subjected to extreme tests after four and eight months of use; four monitors were dropped on concrete, and four monitors were dropped in the manure pits and recovered after 10 sec. A calibration gas was used to regularly check the accuracy drift of each of the monitors six times during the project.

Results and Discussion

The absolute average drift of all the monitors after 328 days was from 0.6 to 2.0 ppm, with an absolute maximum drift of 2.7 ppm. This maximum drift Was much less than the maximum drift Draeger specified, which was 12 ppm after one year. There was a significant difference in the drift of the monitors after the first six months (p<0.05), but after six months,

Draeger micoPac monitors, calibrated yearly, are good tools to warn workers of H_2S in pig barns.

there was no significant drift of the monitor accuracy. There were also no significant differences between the monitors (p>0.05).

Implications

Draeger microPac monitors with a calibration every year are good tools to warn workers of high H_2S in swine barns. Any effects of repeated abuse on the monitors is unknown, but the monitors performed consistently under normal swine housing conditions, including dropping on concrete and into manure pits. The accuracy drift of the monitor was acceptable over one year without any monitor calibrations to help ensure safe working conditions in swine operations.

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Figure 1: Draeger microPac H₂S monitor.

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