



Techniques to Control Odorous Compounds, Gas and Bioaerosols in Swine Buildings

Thousands of swine workers are being exposed to dangerous gases, bioaerosols, and odorous compounds in swine buildings. Throughout the years several techniques have been developed to control environmental dispersions of pathogens such as feed additives, cleaning methods, sprays, electrostatic precipitators, manure separation, and air filtration. Researchers from the Institut de recherche et de développement en agroenvironnement (IRDA) and Centre de recherche de l'Institut universitaire de cardiologie et de pneumologie de Quebec (CRIUCPQ) are currently undergoing tests to optimize existing strategies to control airborne contaminants in swine buildings. Modifications of three strategies: solid-liquid manure separation, oil sprinkling, and biotrickling are being conducted to improve effectiveness of airborne dust, gas and human pathogens reduction.

Reduction Strategies

Solid-Liquid Manure Separation: fractures the liquid and solid phases of manure using different techniques such as slates and scrapers. Separation of manure from liquid and solid phases helps reduce odorous emissions and supports biological treatments.

Oil Sprinkling: a technique used to reduce air pollutants such as dust in swine barns. Based on the rate of application and the type of oil, sprinkling can effectively control 70-95% of dust emissions.

Biotrickling Filter: an air treatment unit that filters the emissions from pig buildings. The filter consists of a nutrient solution that reduces bioaerosols such as ammonia.

Optimizing Reduction Strategies

Solid-Liquid Manure Separation

- 1) A new customized design of slats was developed for commercial-scale manufacturing.
- 2) Components of scraper were adjusted to improve separation of manure.

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Oil Sprinkling

Changes were made to the application of oil sprinkling by adding an automatic timer to improve consistency



Biotrickling Filter

Air treatment unit was altered by adding spray nozzles to enhance the saturation of the filter bed.



Images provided by IRDA

The *Air quality in Canadian pig buildings* project, is one of two projects in the Animal Housing Environment priority area, under Agrivita Canada Inc.'s Canadian AgriSafety Applied Research Program, led by a national team of researchers from the Institut de recherche et de développement en agroenvironnement (IRDA), and Centre de recherche de l'Institut universitaire de cardiologie et de pneumologie de Québec at the Université Laval (CRIUCPQ), University of British Columbia, the Canadian Centre for Health and Safety in Agriculture (CCHSA) and the Canadian Agricultural Safety Association (CASA).

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