

DEVELOPMENT OF AN INNOVATIVE AIR CLEANING SYSTEM FOR SWINE BUILDINGS

PROJECT LEADER

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PROJECT OBJECTIVE

The overall objective of this project is to improve the acceptability of swine facilities in rural areas by reducing their potential environmental impacts.

The air treatment unit, tested at both the laboratory and commercial scale, offers promising results to reduce odour, ammonia, dust and bacteria emissions from new or existing swine buildings.

FINAL RESULTS

LABORATORY-SCALE AIR TREATMENT UNIT (ATU) DEVELOPMENT AND EVALUATION

An innovative ATU was developed based on biotrickling filters which use microorganisms to degrade pollutants. Extensive tests were conducted in the laboratory using bench scale pig chambers to determine the effect of different operating parameters. The removal efficiencies obtained were up to 68%, 82%, 96% and 36% for ammonia, odours, bacteria and viruses respectively.

COMBINATION OF A BIOFILTRATION TREATMENT WITH THE ATU

Reductions in odour and gas emissions were measured by combining the ATU with one of four biofiltration treatment units. Results showed a significant increase in removal efficiency but the size required by both systems could hinder any gains.

EVALUATION OF A COMMERCIAL-SCALE ATU IN AN ACTUAL SWINE BARN

The performance of a commercial-scale ATU was assessed under real barn conditions at the Prairie Swine Centre inc. over a 12-week period. The ATU provided robust and consistent performance. Weekly average removal efficiencies obtained during these tests were up to 77%, 92% and 75% for ammonia, dust and odour, respectively. The biotrickling air treatment unit shows great promise in alleviating one of the long-standing challenges the pork industry faces, reducing odour and airborne emissions from hog facilities.

