

Reduction of Odour and Gas Emissions from Swine Buildings Using Canola Oil Sprinkling and Alternate Diets

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This three year project evaluates the impact of four canola oil application rates combined with three diet formulations on odour and gas emissions from grower-finisher swine buildings. This strategy, combining engineering and nutrition expertise, is expected to significantly reduce the potential impact of the pig barn on its surroundings. Over the first year of the project, an experimental setup of twelve independent chambers housing four castrated males was built. Those chambers are provided with uniform heating and ventilation rates, and with various instruments to continuously measure temperature, relative humidity, dust and gas concentrations, and to collect odour samples. This laboratory setup was used to measure effects of the different treatment combinations. Laboratory measurements were collected over four trials, lasting three weeks each.

The different diets (C: 18% crude protein, LP: 16% crude protein and LP-FC: 16% + ground soybean hull) had no significant impact on the daily feed intake and the average daily gain. The low-protein diets had an impact on ammonia emissions ($P < 0.05$). The results showed that the canola oil sprinkling treatment reduced dust from 88 to 96% ($P < 0.05$). However, treatments did not affect hydrogen sulphide and carbon dioxide emission rates. The diets without oil application had no significant impact on the odour emissions. Odour reductions of 20 and 13% were only observed with the control diet and the oil application rates of 10 and 30 ml/m²-day ($P < 0.05$). All the other oil and diet combinations maintained or increased the odour emissions.