

Title: Health Significance of Airborne Particles at Pork Production Facilities
NPB #99-116

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Abstract

This project was designed to measure several indicators of air pollutants in the exhaust air streams from swine building exhaust fans, and during sprayfield applications of lagoon effluent. The goal was to obtain sufficient information that the distribution of dust, odors, odorous compounds, ammonia, endotoxin, and bacteria close to the sources (fans and spray operations) could be used to predict levels further downwind. In particular, correlation of odors, odorous compounds, endotoxin, and bacteria concentrations with dust concentrations is desired, since positive correlation could allow us predict these pollutant levels by predicting dust levels using existing dispersion models.

Due to project delays involving dust instrumentation, personnel changes, difficulties in securing collaboration with a swine producer having a suitable site, and weather, data collection is still being conducted. Results obtained to date include: 1) establishment of a robust protocol for measuring the air pollutants in a grid of samplers downwind of the sources including tripods and generators for powering the samplers, 2) chemical analyses from air samples collected in Tedlar bags and absorbent tubes which show the levels of numerous odorous compounds, that the Tedlar bags absorb some compounds to an extent that will confound odor measurements, and substantially greater odorous compound levels within the plume near the fans than farther downwind, 3) comparison of 10, 20, and 30 second sampling periods for bacteria at the exhaust fans which suggest 10 to 20 second sampling is appropriate, and 4) development of a new method of measuring odorous compounds in air and dust using adsorbent tubes (small glass tubes filled with material to which odorous compounds adsorb) which will be employed in subsequent field trials. Additional data to be collected during mild and warm weather include the air pollutant levels at sampling locations when wind carries the fan airflow toward the lagoon (not vice versa), and correlation of the air pollutants with dust levels at the sampling locations.

These research results were submitted in fulfillment of checkoff funded research projects. This report is published directly as submitted by the project's principal investigator. This report has not been peer reviewed

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