# Air Dispersion Model Calibration for Alberta

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Odours from intensive livestock operations are a major challenge to the sustainable development of the livestock industry. Odour is produced in the livestock housing and manure storage systems. Odour is then dispersed on the wind and affects neighbours. This study is the first step in calibrating standard air dispersion models to fit Alberta conditions for odours emitted from livestock facilities. A database of odour emissions from barns, feedlots, and manure storage facilities and evaluation of factors affecting dispersion will move the current empirical siting tool of minimum distance separation (MDS) to a more science/engineering based approach.

Two swine barns were selected in central Alberta. A field protocol was developed and trained observers from the University of Alberta and Alberta Agriculture measured the odour dispersion for 4 weeks at each site at 6 am, 12 pm, and 6 pm. Five observers started 950 metres downwind from the barn, equally spaced across a 22.5 degree arc. Observers moved 150 metres towards the barn at 8-minute intervals.

Barn odour emissions were measured by olfactometry. Manure storages were monitored and air quality measured using a wind tunnel constructed by the AgTech Centre (Agriculture) and based on Australian plans.

**Implications**

Community acceptance of new and expanding swine operations will be improved by using a siting tool that predicts the effects of a new operation on the neighbourhood in terms of intensity and frequency of odours. Air dispersion modelling is an accepted that will allow this. Another benefit is that new odour reducing technologies can be evaluated in terms of air quality improvement expected in the neighbourhood of swine barns.