

Airborne cow allergen, ammonia and particulate matter at homes vary with distance to industrial scale dairy operations: an exposure assessment. *Environmental Health*

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Abstract

Background

Community exposures to environmental contaminants from industrial scale dairy operations are poorly understood. The purpose of this study was to evaluate the impact of dairy operations on nearby communities by assessing airborne contaminants (particulate matter, ammonia, and cow allergen, Bos d 2) associated with dairy operations inside and outside homes.

Methods

The study was conducted in 40 homes in the Yakima Valley, Washington State where over 61 dairies operate.

Results

A concentration gradient was observed showing that airborne contaminants are significantly greater at homes within one-quarter mile (0.4 km) of dairy facilities, outdoor Bos d 2, ammonia, and TD were 60, eight, and two times higher as compared to homes greater than three miles (4.8 km) away. In addition median indoor airborne Bos d 2 and ammonia concentrations were approximately 10 and two times higher in homes within one-quarter mile (0.4 km) compared to homes greater than three miles (4.8 km) away.

Conclusions

These findings demonstrate that dairy operations increase community exposures to agents with known human health effects. This study also provides evidence that airborne biological contaminants (i.e. cow allergen) associated with airborne particulate matter are statistically elevated at distances up to three miles (4.8 km) from dairy operations.