A LONGITUDINAL STUDY OF EXPOSURE TO LIVESTOCK ODOR AND SYMPTOM REPORTS IN CHILDREN

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Background and Aims: Industrial livestock operations are sources of dusts and gasses that can affect respiratory health. Associations between school proximity to industrial hog operations and prevalence of asthma-related illness in children have been seen in cross-sectional studies. We conducted a longitudinal study of air pollution from industrial hog operations and symptom reports.
Methods: 340 children aged 11-15 attending schools near industrial hog operations completed daily diaries in science class for 3-5 weeks in February-November 2009. Odor was reported for the previous 24 hours in each diary record. Participants recorded the current strength of eleven symptoms on a five-point scale (none, barely there, present, strong, or very strong). Logistic fixed effects models were used to examine within-person associations between livestock odor and binary symptoms with adjustment for concurrent reported odors of vehicle exhaust and smoke from fires.
Results: Livestock odor was reported by 255 participants (75%) during follow-up. The median proportion of study days participants reported livestock odor and strong livestock odor was 29% and 12%, respectively. Reported livestock odor in the previous 24 hours was associated with increased symptom reports for respiratory and irritation symptoms. Log odds (±standard error) following exposure to livestock odor were 0.44±0.25 for chest tightness, 0.57±0.26 for shortness of breath, 0.40±0.13 for cough, 0.36±0.15 for sore throat, and 0.46±0.18 for burning eyes or nose. Children reporting current wheeze at baseline (N=65) experienced stronger effects of livestock odor on chest tightness, shortness of breath, and wheeze than children not reporting current wheeze. Among participants with allergies (N=83), logs odds for burning eyes or nose increased to 0.97±0.29, while other associations were similar.
Conclusions: These associations are consistent with cross-sectional studies of respiratory conditions in children and a previous longitudinal study of symptoms in adults living near industrial hog operations.