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7C.02

Measurements of Airborne Influenza in a Healthcare Facility. WILLIAM G. LINDSLEY (1), Francoise M. Blachere (1), Terri A. Pearce (1), Stephen Davis (2), Melanie Fisher (2), Rashida Khakoo (2), Barbara J. Meade (1), Owen Lander (2), Robert E. Thewlis (1), Bean T. Chen (1), Ismail Celik (2), Don H. Beezhold (1), *(1) NIOSH, Morgantown, (2) West Virginia University*

Influenza is transmitted from person to person by multiple pathways, which may include inhalation of small aerosol particles generated when infectious individuals sneeze, cough, speak or breathe. However, the relative importance of airborne transmission compared to other routes of infection is unknown and is the subject of considerable debate. To assess the amount of potentially infectious airborne influenza virus in typical healthcare settings, we collected size-fractionated aerosols in a hospital emergency department and a student health clinic during influenza season. Aerosols were collected using a novel two-stage cyclone sampler with a first-stage cutoff diameter of 4 micrometers, a second-stage cutoff diameter of 1 micrometer, and a filter to collect particles less than 1 micrometer. At 3.5 liters/minute, the novel sampler conforms to the ACGIH/ISO criteria for respirable particle sampling. Sampling was conducted on 8 days for 3 to 5 hours per day during influenza season. Fourteen healthcare workers were equipped with personal samplers, and 98 samplers were mounted on stands in waiting rooms, exam rooms and reception areas. RNA in the collected material was isolated, reverse-transcribed and amplified using real-time PCR with primers specific to an Influenza A matrix protein. Preliminary results indicate that influenza virus was detected in 3 of 14 personal samplers and 10 of 98 stationary samplers, and that 50% of the viral particles were detected in the respirable aerosol fraction. The results suggest that a measurable amount of airborne influenza virus can be found within a typical healthcare facility, and that the amount of airborne virus varies considerably both spatially and temporally.

7C.03

PM2.5 and PM10 Concentrations in Four Dairies on the Southern High Plains. CHARLES W. PURDY (1), R. Nolan Clark (1), David C. Straus (2), *(1) USDA-Agriculture Research Service, (2) Texas Tech University Health Sciences Center*

Air quality was determined in 4 dairies at the boundary, commodity barn, and compost field. Two laser DustTrak PM10 aerosol monitors and four RAAS-300 gravimetric monitors, 2 $PM_{2.5}$ and 2 PM_{10} were employed. The DustTrak flow rate was set at 1.7 L/min and the RAAS were set at 16.6 L/min. Monitors were placed upwind and downwind at each location for 8 days in summer and winter. DustTrak PM_{10} monitors determined that the highest mean dust concentration occurred between 7:00 AM (141 +/- 11 micro-g/m^3/h) to 8:00 AM (143 +/- 10 micro-g/m^3/h) for the dairies. Summer concentrations were: boundary, 96 +/- 3 micro-g/m^3/h; commodity barn, 113 +/- 3 micro-g/m^3/h; compost field, 136 +/- 10 micro-g/m^3/h; and winter: boundary 100 +/- 4 micro-g/m^3/h; commodity barn, 71 +/- 2 micro-g/m^3/h, compost field, 38 +/- 1 micro-g/m^3/h. The maximum mean concentration for the 3 locations ranged from 634 to 4915 micro-g/m^3/h (summer) and 598 to 1140 micro-g/m^3/h (winter). RAAS mean $PM_{2.5}$ and PM_{10} were significantly higher in the winter ($PM_{2.5}$ 33 +/- 3 and PM_{10} 98 +/- 4 micro-g/m^3/24 h) compared with the summer ($PM_{2.5}$, 18 +/- 1 and PM_{10} 72 micro-g/m^3/24 h). The mean $PM_{2.5}$ upwind concentration (19 +/- 3 micro-g/m^3/24 h) was not significantly different than the concentration (18 +/- 2 micro-g/m^3/24 h) downwind of the dairy; however, mean PM_{10} boundary downwind concentration was significantly higher (91 +/- 3 micro-g/m^3/24 h) compared to the upwind (48 +/- 6 micro-g/m^3/24 h). Maximum PM_{10} concentration ranged from 288 to 781 micro-g/m^3/24 h, and $PM_{2.5}$ concentration ranged from 104 to 125 micro-g/m^3/24 h. Impact: collectively the 4 dairies studied were out of compliance for PM_{10} concentration for 24 days (7.9%), and for $PM_{2.5}$ concentration for 39 days (5.5%).

AAAR 27TH ANNUAL CONFERENCE

October 20–24, 2008
Rosen Shingle Creek
Orlando, Florida

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