

Poster #15**Brita Kilburg-Basnyat****PhD Candidate, College of Public Health****Human Toxicology****Title of Research:** Validation of Electrostatic Dust Collectors (EDCs) as Effective Endotoxin Passive Sampling Devices**Other Authors:** Brita Kilburg-Basnyat, BS; Nervana Metwali, PhD; Peter S. Thorne, PhD**Introduction/Purpose:**

The purpose is to investigate the role of EDC handling and current cloth preparatory procedures on sampling endotoxin concentrations and to optimize conditions to enhance EDC sampler performance.

Experimental Design:

EDCs consist of two electrostatic cloths secured inside a polypropylene folder for passive sampling. Heated (160°C, 6 hr) and unheated electrostatic cloths were deployed for 7 days in farm homes (n=10) and endotoxin concentrations were compared to determine the better preparation method. Ten EDCs were spiked with dust and mailed and compared to corresponding dust samples to determine if mailing affects endotoxin loading. EDCs were also deployed in farm homes (n=15) to determine the effect of endotoxin sampling over different deployment periods (7, 14, or 28 days). In another study, EDCs were placed in 17 apartments to determine what impact placement near heated ventilation might have on endotoxin loading. The two EDC cloths within each EDC were compared to determine precision of duplicate sampling.

Results:

Heating EDC cloths decreased endotoxin variation compared to unheated cloths with GSD of 2.6 and 3.9, respectively. A paired T-test indicated no significant difference between mailed dust-spiked EDC cloths and dust only endotoxin concentrations (p=0.19). Endotoxin concentrations from in front of and away from heated ventilation were not significantly correlated. Linear mixed models indicated a highly significant effect of sampling period. Model estimates for 7-, 14- and 28-day sampling periods were 934, 2010, and 2770 EU/m², respectively. The model estimates demonstrated an apparent reduction in sampling efficiency from day 14 to day 28. The EDCs had a high degree of correlation within each folder (0.96; p<0.001).

Conclusions:

EDCs should be heated to remove preexisting endotoxin prior to assembly and EDCs can be mailed without degradation. EDCs should be deployed in consistent locations to avoid disruption of endotoxin loading. 14 day deployment duration is preferred for endotoxin sampling.