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Title of Research *	The Effect of Deployment Time on Endotoxin Sampling Efficiency
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Introduction & Purpose *

Endotoxin can produce adverse health effects and decrements in pulmonary function. Electrostatic Dustfall Collectors (EDCs) are passive samplers that can be used to assess exposures to endotoxin. They consist of a non–static polypropylene folder holding two electrostatic cloths each with an exposed area of 205 cm². EDCs are inexpensive and more convenient in large cohort studies compared to active sampling. A previous study (Noss et al, 2010) suggested that EDCs may have a maximum endotoxin sampling period of two weeks. Thus, a comparison of three sampling periods was performed to establish a suitable EDC deployment time for endotoxin.

Experimental Design *

EDCs were placed in Iowa farm homes for 7, 14 and 28 days followed by analysis of endotoxin using the kinetic chromogenic Limulus Amoebocyte Lysate (LAL) assay.

Results *

Endotoxin exposure estimates were significantly correlated based on 7 and 14 day samples (Pearson $r=0.89$; $p<0.0001$); 7 and 28 days ($r=0.89$; $p<0.0001$); and 14 and 28 days ($r=0.92$; $p<0.0001$). EDC deployed for 14 days had significantly higher endotoxin amounts per unit area than samples deployed for 7 days (ANOVA $F=7.51$; $p<0.01$). However, this was not true for 28 day samples (ANOVA $F=0.93$; $p>0.05$). Duplicative sampling of endotoxin concentrations within EDCs were significantly correlated (Pearson $r=0.94$; $p<0.0001$).

Conclusions *

Endotoxin loading from 28 days were saturated and not significantly increased from 14 day values. Although, all endotoxin values were detectable, other analytes from the EDCs such as cat, dog, mouse and cockroach allergens, required 14 days of sampling to achieve detectable values in most homes. EDCs with two electrostatic cloths can effectively sample similar endotoxin concentrations within an EDC, indicating that one EDC cloth would be sufficient.

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