media was TSB, but lower values for the other fluids. Relative recovery for human adenovirus approached 1 for deionized water at the smallest particle sizes, but was lower for other fluids and larger particles. Recovery of live swine and avian influenza virus was poor under all conditions. On average, the Andersen impactor yielded higher values of R than the MOUDI impactor. Using gelatin filters did not improve virus recovery. **Conclusions:** Impactors can be used to sample live virus size-selectively, but high recoveries are possible for only some viruses

PO 133-3
Microbial Exposure Patterns and Concentrations in Feed Industry

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Objective: The objective of this study is (a) to investigate the distribution patterns and exposure concentrations of bioaerosols in livestock feed industries and (b) to compare the bioaerosol concentrations by two impaction methods and one filtration method. **Methods:** Airborne bacteria, fungi, endotoxin and dust were measured in 3 feed manufacturers. Airborne bacteria and fungi were measured with one stage impactor, six stage cascade impactor and gelatin filters. Endotoxin was collected with polycarbonate filters and analyzed by kinetic chromogenic LAL method. **Results:** The geometric means of airborne concentration of bacteria, fungi, endotoxin and dust in raw material process was 326 CFU/m^3, 953 CFU/m^3, 9.2 EU/m^3, and 0.9 mg/m^3. In pelleting process, 861 CFU/m^3, 428 CFU/m^3, 18.4 EU/m^3, and 0.63 mg/m^3. In packaging process, 545 CFU/m^3, 491 CFU/m^3, 19.8 EU/m^3, and 0.4 mg/m^3. In outdoor, 85.7 CFU/m^3, 281 CFU/m^3, 6.8 EU/m^3, and 0.2 mg/m^3. The results shows that the bacteria and temperature at pelleting process and the endotoxin and humidity at raw material process were significantly higher than the other processes ($p<0.05$). The ratio of indoor to outdoor concentration was 6.2, 1.9, 3.2 and 3.2 for bacteria, fungi, endotoxin and dust. The respiratory fraction of bacteria comprised 59.4, 72.0% and 57.7% and 77.3%, 89.5% and 83.7% for fungi endotoxin and bacteria concentration have strong correlation with all culture based methods (single stage, r=0.661, 6-stage r=0.623, filtration r=0.612). Among the bioaerosol sampling methods, filtration method was significantly higher than two impaction methods in bacterial and fungal concentrations. **Conclusion:** We found that bioaerosol results in feed industry shows that the Indoor/Outdoor ratio of microorganisms was larger than 1 and respiratory fraction pattern of microorganisms was more than 50% which indicate that occupational environment control for preventing worker's respiratory disease was necessary.

PO 133-4
Culture-Independent Characterization of Bacteria in Poultry and Dairy Bioaerosols Using Pyrosequencing: A New Approach

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Introduction: Culture-based methods are often used for characterization of bioaerosols. Limitations exist with culture-based methods as only microorganisms which are viable and able to grow on selected media can be characterized. A need exists to develop methodologies which are not subject to the limitations of culture-based characterization. Novel molecular techniques such as bacterial tag-encoded flexible (FLX) amplicon pyrosequencing (bTEFAP) may be a useful for the characterizing of bioaerosols. **Objective:** Use bTEFAP to characterizing and estimate concentrations of bioaerosols in dairy and poultry facilities. **Methods:** bTEFAP was used to characterize inhalable bioaerosols present in poultry and dairy facilities over an eight-hour work shift. Both personal and area samples were collected using the IOM at 2 L/min and a gelatin filter. The DNA present was pyrosequenced targeting the 16S bacterial genetic region. This genetic region if often targeted for identifying bacteria in environmental microbiological studies. The relative percentages of bacteria present in each sample were reported. **Results:** Preliminary results suggest large distributions of bacteria among inhalable samples collected in poultry and dairy facilities. Of the bacteria detected, 369 genera were identified. The inhalable bacteria concentrations were estimated to be 7503 cells/m^3 and 7657 cells/m^3 in poultry and dairy facilities, respectively. Prevalent bacteria identified in the dairy facility: *Papilibacter* (83%), *Clostridium* (53%) and *Clostridium lituseburense* (51%). Bacteria identified in the poultry facility: *Staphylococcus cohnii* (23%), *Staphylococcaceae* (14%). **Conclusions:** Bioaerosols were characterized; however concentrations of bacteria were lower than previously reported and these bacteria may not be viable. This is the first application of pyrosequencing technology for the characterization of bioaerosols. Furthermore, the fast processing speed of molecular techniques may revolutionize the ability to identify the phylogeny and concentration of bioaerosols. The impact of this technology has yet to be realized by the scientific community dedicated to evaluating occupational and environmental bioaerosol exposure

PO 133-5
Inhalable and Respirable Organic Dust Concentrations during Broiler Production

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Introduction: Organic dust is often a complex mixture of bedding, feces, skin, as well as various microorganisms and endotoxins. Little information is available about characteristics of organic dust and concentrations in broiler production. Exposure to organic dust has been associated with pulmonary symptoms and declines in the pulmonary function. **Objectives:** The objective of this study was to assess organic dust concentrations during the seven-week growth period in a broiler production building and provide respiratory protection recommendations to broiler producers. **Methods:** Dust concentrations were measured in a broiler production facility which housed approximately 27,000 birds. Inhalable and respirable dusts were measured gravimetrically using and IOM and aluminum cyclone at 2.0 and 2.5 L/min, respectively. Samplers were attached to a mannequin of the broiler production building which rotated 90° every 30 minutes for 12 hours. Samples were collected once per week over the seven week broiler growth period. **Results:** The lowest inhalable dust concentration was measured at 0.5 mg/m^3 during the first

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