

## **IMPORTANCE OF SIZE-SELECTIVE PARTICLE MEASURING FOR ASSESSING OCCUPATIONAL EXPOSURES – A CASE STUDY “FROM FIELD TO FORK”**

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Sampling the total air concentration of particulate matter (PM) only provides a basic estimate of exposure that normally not allows correlating with the observed health effects. Therefore is of great importance to recognize the particles size distribution and, particularly, the exposure to fine particles ( $\leq 2.5 \mu\text{m}$ ). This particles dimension corresponds to the respirable fraction, the one that can implicate local and systemic effects due to particle deposition and clearance from the lungs and transport within the organism.

This study intended to describe occupational exposure to PM<sub>2.5</sub> in three units related with swine production and consumption, namely: feed production, swine production and swine slaughterhouse. A size-selective particle measuring in five to six workplaces of each unit was performed. Measurements of PM were done using a portable direct-reading hand-held equipment (Lighthouse, model 3016 IAQ).

Data showed slaughterhouse unit with higher values, with values ranging from 0.030 to 0.142 mg/m<sup>3</sup> ( $0.073 \pm 0.043$ ), being the cutting room the workplace with higher values. In feed production unit, values were between 0.026 and 0.033 mg/m<sup>3</sup> ( $0.028 \pm 0.003$ ) with the warehouse of pharmacy products as the workplace with higher values. Finally, in swine unit values ranged from 0.006 to 0.048 mg/m<sup>3</sup> ( $0.023 \pm 0.017$ ) with the batteries area presenting the higher values.

PM can be rich in fungi and bacteria and their metabolites, such as endotoxins and mycotoxins. Previous publications already showed high contamination in these occupational settings and particles can have an important role in exposure since can easily act as carrier of these agents.

Data acquired allow not only a better prediction of particle penetration into respiratory regions of the respiratory tract, but also a better estimation of PM health effects. Moreover, data permit to identify the workplaces where investment should be made to prevent and reduce exposure.

*Keywords:* particles, occupational exposure, size-selective measuring