

INHALABLE DUST AND ENDOTOXIN EXPOSURE AMONG DANISH PIG, DAIRY, POULTRY AND MINK FARMERS: RESULTS FROM THE SUS COHORT STUDY

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Objectives To provide information on variability and levels of personal dust and endotoxin exposure in different sectors of the primary animal production based on the same methodology.

Methods 507 personal inhalable dust samples were collected from 327 Danish workers in 56 pig, 26 dairy, 4 mink and 3 poultry farms. Measurements in pig and dairy farmers were full-shift and performed during summer and winter. In contrast, poultry and mink farmers were monitored during four well-defined production stages. The sampled dust was analysed gravimetrically and its endotoxin content by the Limulus amoebocyte lysate assay. Descriptive and random-effect regression analyses were used to summarize levels and variability in measured dust and endotoxin exposure concentrations.

Results The overall geometric mean exposure was 2.5 mg/m³ (range < LOD-47.8) for dust and 992.3 EU/m³ (range < LOD-374 579) for endotoxin. Inhalable dust and endotoxin concentrations were highest among pig and poultry farmers, and lowest among dairy and mink farmers, respectively. Exposure among pig and cattle farmers was characterised by a large day-to-day variability that increased from indoor to outdoor working environment. Only mink farmers could meet the Danish occupational exposure limit for total dust (3 mg/m³); the recently proposed Dutch exposure-limit for endotoxin (90 EU/m³) was exceeded by more than 93% of our measurements.

Conclusions Danish animal farmers are exposed to levels of dust and endotoxin exposure potentially hazardous for their respiratory health. The development of exposure reduction strategies will require in-depth knowledge of factors affecting day-to-day variability in exposure.