

Abstracts

This inter-pathway comparison was performed (1) in a generic way by exploring the chemical property space and (2) by selecting realistic case studies for different types of consumer products.

The development of the DustEx model for substance transfer was supported by a small-scale field study under controlled conditions. In this study the transfer of deuterium-labelled semi-volatile organic compounds from artificial consumer products to indoor air and settled dust was analysed. Altogether two measurement campaigns were conducted. The first field study had enrolled five apartments for twelve weeks. During the second field study three apartments selected from the previous five were investigated for eight weeks. The field study results were used to validate the model.

The results of the inter pathway comparison were summarised in a conservative decision tree that gives guidance on when to consider the dust pathway in a risk assessment of a substance released by a single consumer product. In the case studies it was shown that compared to conservative, lower Tier calculations of direct exposure to a product, the dust pathway was always negligible (lower by more than 1 order of magnitude). Only in higher Tier assessments with refined parameters for other pathways, the pathway of dust ingestion may be important.

046-4 DEVELOPMENT OF A QUANTITATIVE JOB EXPOSURE MATRIX FOR ENDOTOXIN EXPOSURE IN AGRICULTURE

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Objective To develop a quantitative job exposure matrix (JEM) for the assessment of endotoxin exposure among farmers and other agricultural industry workers.

Methods An exposure database containing 3,384 personal endotoxin measurements from Western European and Canadian workers employed in animal and crop production and related-industries with endotoxin exposure between 1992 and 2008 was established. Data were log-transformed and modelled with linear mixed effect models where job-titles, company (within job-titles) and worker (within company) identities were treated as random effects. Fixed effects were year and season of measurement, sampling duration and an exposure prior (none, low, high) for every job code (ISCO-68) from an existing JEM for general population studies.

Results The model results suggested overall levels of endotoxin exposure to decline annually by almost 2%. Season was a strong determinant of endotoxin exposure with measured concentrations being higher during the winter ($\beta = 0.64$; $p < .0001$) compared to the summer. Effects of sampling duration on the exposure were rather small. Predicted exposure levels were highest among wheat, vegetable, crop and poultry farmers and lowest among nursery garden workers, gardeners and horticulture

farmers. Derived exposure estimates showed good agreement with endotoxin levels reported in the literature and not included in the database.

Perspectives The model predictions will be used to develop a quantitative JEM with a time axis for endotoxin exposure to be used in epidemiological studies among farmers and agricultural industry workers.

046-5 AN EXPLORATION OF THE USE OF A LOW COST OPTICAL PARTICLE COUNTER TO ASSESS OCCUPATIONAL EXPOSURE TO ORGANIC DUST IN THE AGROFOOD INDUSTRY

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Introduction Exposure to organic dust is a well-known risk in the agro food sector. A transition from gravimetric analyses of dust to real-time direct reading equipment is taking place. The goal of this study is to explore the validity of using a low cost sensor, the Optical Particle Counter (OPC), for assessing occupational exposure to organic dust in the agrofood industry.

Methods In two onion processing companies particle number concentration (PNC) was continuously monitored for 7 days with 2 OPC devices, a TSI 3321 Aerodynamic particle sizer (APS), and a 3081 scanning mobility particle sizer (SMPS). Correlations between PNC as obtained by the different types of direct reading equipment were investigated for OPC versus OPC and for a combination of APS and SMPS vs OPC.

Results A high correlation between total PNC obtained by two OPC devices in both companies ($r = 0.99$ and $r = 0.70$) was observed. The observed correlation between total PNC obtained by combining the APS and SMPS and the two OPC devices was moderate ($r = 0.58$ – 0.62 and $r = 0.35$ – 0.48). A large variability in hourly correlations between APS/SMPS and OPC is observed. It is currently being explored if the correlation is affected by (variability in) the size distribution or total particle count.

Conclusions The preliminary results give some indication that low cost real-time sensors, like the OPC, may be used to monitor occupational exposure to particulate matter, providing the opportunity to obtain real time exposure data. Since endotoxin as components of organic dust is a major concern in the agrofood industry, the feasibility of using the OPC as the basis for an 'online' screening method for endotoxin is currently being explored in an experimental setup.

046-6 CHARACTERISTICS OF SEASONAL DISTRIBUTION OF AIRBORNE ENDOTOXIN AND (1 \rightarrow 3)- β -D-GLUCAN IN LABORATORY ANIMAL ROOMS IN SEOUL, SOUTH KOREA

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Airborne endotoxin and (1 \rightarrow 3)- β -D-glucan can cause adverse health problems and lead to potentially occupational exposure to