

October 2015 Alive & Well Updates: Respiratory Symptoms in Ag Populations

The effect of occupational farming on lung function development in young adults: a 15-year follow-up study. Bolund, ACS; Miller, MR; Basinas, I et al. Occupational and Environmental Medicine, Oct 2015; 72(10): 707-13.

Objectives: Longitudinal studies on the effect of farming on lung function in young participants are few. Our objective was to explore if exposure to farming impaired lung function in young adults.

Methods: We studied 1964 farming students and 407 controls in 1992/2004, and carried out follow-up in 2007/2008. Spirometry, skin prick test and bronchial hyper-responsiveness (BHR) were assessed, height and weight measured, and questionnaires covering health and occupation were collected. Cumulative dust and endotoxin exposures were estimated from modelled personal dust measurements. Lung function effect was expressed as change in z-score during follow-up using the Global Lung Initiative 2012 project prediction equations. Longitudinal data were available for 1134 young participants \leq 25 years at baseline.

Results: We found no differences in lung function Delta z-scores between farmers and controls, however, adjusted multivariable linear regression showed a negative effect among current farmers on Delta zFEV1 (forced expiratory volume in 1 s; -0.12 , $p=0.006$) and Delta zFEV1/FVC (forced vital capacity; -0.15 , $p=0.009$) compared to ex-farmers. An interaction was found between sex and farming, showing that current farming suppresses Delta zFEV1 and Delta zFVC more among females. Smoking in farmers had a deleterious effect on Delta zFEV1, which was not seen in controls, though no significant interaction was found. Farm upbringing protected against impairment of lung function, and BHR at baseline had a deleterious effect on Delta zFEV1 only in those not raised on a farm.

Conclusions: We conclude that being a current farmer is associated with a negative effect on lung function, when compared to ex-farmers, with females being more susceptible. Being raised on a farm protects against the adverse effect of BHR on change in lung function.

Prevalence and Risk Factors of Respiratory Symptoms in Rural Population. Karunanayake; Hagel, L, et al. JOURNAL OF AGROMEDICINE Jul 3 2015 20(3) Special Issue: 310-17.

Research has shown that respiratory symptoms, including chronic cough, chronic phlegm, shortness of breath, and wheeze, are important markers that contribute to hospitalization, lung function decline, and other respiratory illness. This report aims to estimate the prevalence of respiratory symptoms and associated environmental risk factors in farming and nonfarming rural-dwelling people. A baseline mail-out questionnaire to assess respiratory health outcomes as well as individual and contextual determinants in farm and small town cohorts was sent to 11,004 households within four geographical regions of Saskatchewan, Canada, in 2010. Completed questionnaires were received from 4624 households (8261 individuals). Outcome variables examined for this report were chronic cough, chronic phlegm, shortness of breath, and ever wheeze.

Clustering effect within households was adjusted using generalized estimating equations. The prevalence of respiratory symptoms was chronic cough, 9.2% (farm vs. nonfarm: 8.1% vs. 10.0%); chronic phlegm, 8.2% (farm vs. nonfarm: 6.7% vs. 9.3%); shortness of breath, 29.1% (farm vs. nonfarm: 25.5% vs. 31.6%); and ever wheeze, 40.6% (farm vs. nonfarm: 38.1% vs. 42.5%). There was a significantly higher prevalence of each respiratory symptom in the nonfarming population compared with the farming population ($P < .01$).

Respiratory symptoms were positively associated with smoking, allergic reaction to inhaled allergens, and other environmental factors for farming and nonfarming populations. The prevalence of respiratory symptoms was higher in the nonfarming rural population compared with the farming rural population. Environmental exposures such as work-related or home environment play an important role in the increased prevalence of respiratory symptoms in farming and nonfarming populations.

A comprehensive review of levels and determinants of personal exposure to dust and endotoxin in livestock farming. Basinas, I; Sigsgaard, T; Kromhout, H. JOURNAL OF EXPOSURE SCIENCE AND ENVIRONMENTAL EPIDEMIOLOGY MAR-APR 2015 25(2): 123-37.

The respiratory health effects of livestock farming have been on debate for more than three decades. Endotoxin-contaminated organic dusts are considered as the most important respiratory hazards within livestock environments. A comprehensive review of the knowledge from studies assessing the exposure status of livestock farmers is still to be published. The present study reviews research published within the last 30 years on personal exposure of livestock farmers to organic dust and endotoxin, focusing on studies on pig, poultry and cattle farmers. Applied measurement methods and reported levels of personal exposure for the total, inhalable and respirable fractions are summarized and discussed, with emphasis on the intensity of exposure and the size and distribution of the reported exposure variability. In addition, available evidence on potential determinants of personal exposure to dust and endotoxin among these farmers are documented and discussed, taking results from exposure determinant studies using stationary sampling approaches into consideration. Research needs are addressed from an epidemiological and industrial hygiene perspective. Published studies have been heterogeneous in design, and applied methodologies and results were frequently inadequately reported. Despite these limitations and the presence of an enormous variability in personal exposure to dust and endotoxin, no clear downward trends in exposure with time were observed, suggesting that working environments within stables remains largely uncontrolled. Exposure control and prevention strategies for livestock farmers are urgently required. These should focus on the development of novel and improved methods of controlling dust and endotoxin exposure within stables based on the currently available knowledge on determinants of exposure.