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Title: Respiratory effects of an exposure to grain dust among grain workers in the Vaud region (Switzerland)

Dr. Victor 8193 Dorribo victor.dorribo@chuv.ch MD [1], Dr. Jacques A. 8194 Pralong jacques.pralong@chuv.ch MD [1], Dr. Pascal 8195 Wild pascal.wild@hospvd.ch [1,2], Dr. Gabriel 8197 Reboux gabriel.reboux@univ-fcomte.fr [3], Dr. Anne 8198 Oppliger anne.oppliger@hospvd.ch [4], Prof. Brigitta 8199 Danuser brigitta.danuser@hospvd.ch MD [1], Dr. Hélène 8200 Niculita-Hirzel helene.hirzel@hospvd.ch [4] and Dr. Peggy 8206 Krief peggy.chagnon-krief@chuv.ch MD [1]. [1] Service of Occupational Medicine, Institute for Work and Health, Lausanne, Switzerland ; [2] Département Epidémiologie En Entreprises, INRS, Nancy, France ; [3] Service of Parasitology and Mycology, CHU De Besançon, Besançon, France and [4] Service of Occupational Hygiene, Institute for Work and Health, Lausanne, Switzerland .

Body: Introduction Bioaerosols such as grain dust (GD) elicit direct immunological reactions within the human respiratory system. Workplace-dependent exposure to GD may induce asthma, chronic bronchitis, and hypersensitivity pneumonitis. Aims To assess the clinical impact of occupational exposure to GD and to determine quantitative biological markers of bioaerosol exposure in grain workers. Methods This longitudinal study has been conducted from summer 2012 to summer 2013, comprising 6 groups of 30 active workers with different GD exposure patterns (4 groups of grain workers, 2 control groups). Two evaluations at high- and low-exposing seasons take place, during which an occupational and a medical history are questionnaire-assessed, lung function is evaluated by spirometry, airway inflammation is measured by exhaled nitric oxide (eNO) and specific blood IgG and IgE are titrated. Results The preliminary results are those of 2 of the 4 exposed groups, (harvesters and mill workers), compared to the control groups, at first assessment (n=100). Mean age is 38.4 [years]; 98% are male. Exposed groups differ from controls ($p<0.05$) in daily contact with animals (57% vs. 40%) and active smoking (39% vs. 11%). Grain workers have more respiratory (50%), nasal (57%), ocular (45%) and dermatologic (36%) occupational symptoms than controls (6.4%, 19%, 16%, 6.4% respectively, $p<0.05$). Lower mean peak-expiratory-flow (PEF) values (96.1 ± 18.9 vs. 108.2 ± 17.4 [% of predicted], $p<0.05$) and eNO values (13.9 ± 9.6 vs. 20.5 ± 14.7 [ppm], $p<0.05$) are observed in the exposed groups. Conclusion Preliminary results show a higher prevalence of clinical symptoms and a lower mean PEF value in the groups exposed to GD.