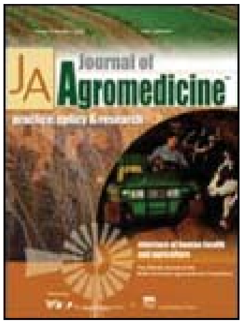

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Controlling Worker Exposure to Dust on Broiler Chicken Farms: Task-Modification Solutions

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this lifeline consists of or how to use it. Most bins were not designed with a lifeline system. A method has been developed that can be easily installed at a low cost. The procedures developed are a result of inputs from members of the Grain Handling Safety Coalition representing a grain bin manufacturer, an agricultural rescue instructor, a farm worker, elevator worker, elevator safety director, safety director for a statewide grain association and a college agricultural safety professor. A review of the literature and discussions with other professionals in the grain industry was conducted. Many sources had general recommendations but none had specific procedures for establishing a lifeline. An appropriately designed lifeline system was developed that can be easily installed and used in a grain bin for less than $1,000. Common components of most systems are a safety lanyard, carabiners, a belay device and a body harness. Anchors are not included because generally no one has designed anchors for most bins. The system developed includes a knot passing pulley for an anchor in the peak of the grain bin and a second anchor attached to the sidewall of a corrugated bin close to the top entry door. These anchors have been approved by a structural engineer for 1800 pound or 3600 pound working load with a 2 times safety factor. A simple-to-use and affordable system was developed. New training materials developed for this procedure include a video, power point presentation and publication describing the components and steps to establish and use the lifeline. The procedure needs to be promoted throughout the grain industry. Kits with the components of the procedure need to be made readily available.

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Controlling Worker Exposure to Dust on Broiler Chicken Farms: Task-Modification Solutions

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Broiler chicken workers are exposed to inhalation hazards that include dust, bacteria, fungi, endotoxin and ammonia. Broiler chicken production is rapidly increasing in the US and broiler farm workers or may not be aware of engineering or task-modification approaches to decrease inhalation exposure to dust during daily tasks. Inhalation exposure to dust was measured during a daily task ("mortality pick-up") performed by a broiler a farm worker. Inhalable dust exposure was measured while using a "traditional" approach to the mortality pick-up task and compared to dust exposure experienced while performing the "modified" mortality pick-up task. Exposure assessment to dust was performed using an inhalable dust sampler in the personal breathing zone of the farm worker. Exposure concentrations were paired ("traditional" vs. "modified") and analyzed using a paired t-test. Mean inhalation exposure was 16.24 mg/m^3 (SD 13.45) while performing the task using the "traditional" method. However, while performing the "modified" task, mean inhalation exposure to dust was 11.95 mg/m^3 (SD 7.68). Preliminary analyses suggest that the observed difference in inhalation exposure between the "traditional" and "modified" task approached statistical significance ($p = 0.09$). However, additional data collection is ongoing. The inhalation exposure observed in this study may be higher than recommended exposure concentrations. However, different samplers were used in this study; therefore direct comparisons to recommended exposure concentrations may be difficult. Furthermore, the mortality pick-up task duration ranged from 1–2 hours per day. Other tasks may result in inhalable dust exposure. However, anecdotal information suggests that the mortality pick-up task resulted in the majority of the daily inhalable dust exposure. Therefore, simple solutions such as task-modification to reduce exposure may prove to be an effective and

inexpensive solution to reduce dust exposure among broiler chicken workers. Future research on dust exposure among agricultural workers should be task-based and evaluate inexpensive engineering solutions to reduce dust exposure.

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Inhalation of Phosphine Gas Following a Fire Associated with Fumigation of Processed Pistachio Nuts

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On December 10, 2009, a fumigation stack containing aluminum phosphide caught fire at a pistachio processing plant in Kern County, California. Untrained personnel responded to the fire, and were exposed to phosphine, and pyrolysis by-products. Ten workers developed respiratory and non-specific systemic symptoms consistent with exposure to phosphine gas. Six of the 10 workers had chest pain or shortness of breath, elevated respiratory rate, or decreased oxygen saturation. The incident illustrates safety problems associated with handling aluminum phosphide, and the inhalation toxicity of its phosphine by-product. The cases were reported to the California Poison Control System, and the Kern County Agricultural Commissioner's Office. During the fumigation, a rainstorm arrived in the area. The downspout's angle next to the fumigation pile, directed rain water to pool and seep under the tarp, reaching trays of aluminum phosphide under the end pallet. The stack of pistachio caught fire, and workers doused the fire with water. Some workers cut open the tarp to direct chemical fire extinguisher on the flames. Workers were exposed to phosphine, phosphorus oxides (POx), combustion from the burning films, bags, cardboards, the extinguisher agent, and may also have come in contact with unreacted aluminum phosphide, and spent materials (primarily aluminum Hydroxides). Affected workers were interviewed at local hospitals, and medical records were reviewed. Ten employees required emergency evaluation, mostly receiving supportive care and had uncomplicated courses of hospital care. A Bakersfield hospital performed bronchoscopy on 3 patients seen there, and showed significant airway inflammation. The incident could have been mitigated if workers had adequate training in handling fumigation emergencies, fumigation done in a manner that allows sudden changes in weather and environment, and advanced notification of employees of an upcoming application.

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Low Back Pain Among Irish Farmers

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There is limited research regarding low back pain (LBP) among farmers in Ireland. This study establishes prevalence, risk factors, consequences and the lived experience of LBP among farmers in Ireland. A questionnaire survey was conducted, using quota sampling to achieve 100 farmers from each of the 6 main Irish farm enterprise systems ($n = 600$) namely dairy, dairy and other, cattle rearing, cattle other, mainly sheep and tillage. Data were analysed using chi square tests, t-tests, Mann-Whitney tests and logistic regression models. Case study video interviews were conducted with 3 dairy farmers regarding their LBP experience. Lifetime, annual and point prevalence of LBP were 46%