

## ENDOTOXIN/DAIRY PROJECT ABSTRACT

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Dairy production is one of the leading agricultural commodities in the High Plains Rocky Mountain Region (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming), and is rapidly growing. More than 1,000,000 dairy workers nationwide, mostly Hispanic, are at risk for respiratory disease from organic dust aerosols. **Our strong relationship with the Colorado Dairy Industry offers a unique opportunity to prospectively study respiratory disease among naïve (previously unexposed) workers. This will be the first study to prospectively address the endotoxin adaptation response concept in this population.** Another novel aspect of this project is **the ability to study endotoxin exposure, respiratory outcomes and genetic factors in a concerted multidisciplinary approach.** The **goals** of this project are to: 1) Characterize worker exposure to endotoxin-containing aerosols and evaluate respiratory outcomes including symptoms, pulmonary function and cellular/immune markers (cytokines) of inflammation (n = 184); 2) Compare exposures and health outcomes among Colorado dairy workers to a comparable study of California dairy workers (n = 200) (conducted by the Western Center for Agricultural Health and Safety); 3) Re-evaluate a subset of new (naïve) workers (n = 92) 1 month (n = 92) and 1 year (n = 46) following their first assessment; 4) Evaluate whether endotoxin assay or GC/MS is the best predictor of biomarkers, symptoms, and changes in pulmonary function; 5) Survey genetic markers related to lung disease and endotoxin etiology TLR4, TLR9, MD2, CD14 gene mutations, and polymorphisms of IL1-RN, and TNF-alpha. 6) Identify job factors associated with highest exposures/greatest risk of respiratory disease, and work closely with the CSU ILM and dairy industry to develop and disseminate cost-effective, culturally acceptable interventions to reduce exposures. Other projects in the HICAHS Center, including the Dairy Ergonomics Intervention, Enhancing Translation/Dissemination projects, and the Outreach program will be key to dissemination throughout the multi-state region. This project includes close collaboration with the dairy industry throughout Colorado and the region, the CSU Integrated Livestock Management Program (ILM), Cooperative Extension, the University of Nebraska Medical Center, NIOSH, NIEHS and the UC Davis NIOSH Ag Center. This **project addresses the need** for more research related to organic dusts identified by the NIOSH Board of Scientific Counselors and the NORA priorities: Asthma and Chronic Obstructive Pulmonary Disease, Mixed Exposures, and Exposure Assessment Methods. This project also addresses several priorities of the PAR 06-057 including reduction of respiratory disease and migrant/seasonal farm workers.