

# Design Guidelines for Healthy and Safe Animal Production Building Systems

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## Project Summary:

The overall aim of the project is to analyze worker health and safety issues related to commercial animal housing for swine, dairy and poultry production systems in the Upper Midwest.



## Methods:

This project conducted stakeholder workshops and identified categories of design interventions for animal housing that through their utilization in the design, construction, and management of these buildings will lead to safer and healthier operations for workers. In 2013, the research team drafted a new research proposal that builds on the outcomes of this project to provide specific and implementable strategies for addressing worker safety issues in the animal agriculture industry. Although the proposal wasn't funded, the findings from the study have been incorporated into a new book and book chapter and continues to be shared by the investigators through other communications channels.

## Results:

The workshops compiled the input from various stakeholder perspectives which included farmers/workers; insurance industry; permitting; pork industry; dairy industry, poultry industry; building/facility industry. Risks were evaluated and given a rating.

- Animal handling and movement—high risk in some industries
- Walking surfaces (slips, trips, falls)—high risk
- Air quality and respiratory problems—high risk
- Bulk material handling—high risk (feed, manure, dead animals, etc.)
- Chemical handling and storage—moderate risk
- Energy risks—moderate
  - Electrical energy exposure and shock
  - Mechanical energy – stationary and movable equipment and vehicles
  - Chemical energy – explosion, chemical burns
- Manure storage(suffocation)—low risk(high fatality)
- Manure storage (suffocation)—low risk (high fatality)
- Feed and grain storage(suffocation)—low risk(potentially fatal)
- Building or equipment fire—low risk(potentially fatal)
- Weather hazards(storm and snow load)—low risk(potentially fatal)

## Conclusion:

Our conclusions falls into two categories: 1. Health and Hygiene development and 2. Facility Design. Proper training can eliminate the hazards from many sources. Strengthening the worker's knowledge to identify environmental agents and improve work practices can minimize damage. Incorporating a well-designed ventilation system will ensure better air quality for workers and animals especially in those facilities that are air-tight and reduce the risk of inhaling toxic gases. Manure Storage Systems: Do not store manure in below ground pits under animal housing buildings that are only covered with slatted floors. Preferred self-contained manure storage is outside of the animal housing facility either below or above ground so animals and people are not exposed to gases and odors. Consciously Designed Space specific to Animal Agriculture Practice: Carefully consider designs specific to the needs of animal agriculture production and practices will address current issues and potentially lower accidents and injuries of workers in these facilities. Design considerations may include larger spaces for animal handling, surfaces that do not accumulate animal debris and manure, better ventilation systems, etc.