

## LIVESTOCK FACILITY DESIGN AND MAINTENANCE

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(For assistance, please contact EHS at (402) 472-4925, or visit our web site at <http://ehs.unl.edu/>)

Properly designed and maintained animal facilities are important in maintaining a safe and healthy environment for confined animals, as well as humans working with the animals. Guidance for incorporating environmental health and safety criteria into facility design and maintenance is provided below. This information can be used when modifying existing facilities or when planning new construction.

This SOP is primarily directed to safety considerations. Considerations that are beyond the scope of this SOP include design criteria specified by the Nebraska Department of Environmental Quality (NDEQ) in Nebraska Title 130, Livestock Waste Control Regulations, and design criteria specified associated with policies of the Institutional Animal Care and Use Committee.

### Facility Design Tips

- Area lighting should be even and diffused. Sharp contrasts between brightly and poorly lit areas produce shadows that may cause animals to panic. Lighting in squeeze and loading chute areas should be at least 10-foot candles.
- Facilities should be designed to allow easy access to and exit from animal confinement areas, as well as emergency exits.
- Electrical outlets and circuits in the building should be grounded and appropriately sized for the load. If they are in a location prone to being wet, they should be equipped with Ground Fault Interrupters (GFIs).
- Use extension cords only for temporary purposes and that are approved for outdoor use. Do not use extension cords in areas that are or may become wet or flooded.
- Incorporate floor design features to ensure even and secure footing for animal handling.
- Loading ramps, chutes, and crowd pens should have solid sides. For optimum design, the chute should be curved and the crowding pen should be round. This can reduce the time spent moving cattle by up to 50%.
- Since herding animals tend to follow each other, each animal should be able to see the one ahead of it. Blocking gates in a chute should not form line of sight barriers to the animal ahead.
- Pay attention to the design of restraint devices. Select devices that are best for the type of animal and the circumstances of use.

- Pay attention to ventilation in the facility. Ventilation can be mechanical or passive, but care should be taken to assure there is a good exchange of air in the animal handling facility. In areas where waste will accumulate, mechanical ventilation is essential during cleaning operations.
- Any sharp protruding surface or point (e.g., edge or corner of a beam, board, cabinet, containers, nails or bolts, etc.) can cause injuries to animals and workers. Sharp protruding surfaces and points should be guarded or eliminated.

### **Facility Maintenance Tips**

- Be a good housekeeper. Put things away after use. Keep aisles, steps, and work areas free of clutter. Keep walking and working surfaces cleared of manure, mud, ice, and grain spills. Sand or agri-lime can be used to aid footing.
- Use appropriate personal protective equipment to protect against potential hazards, including but not limited to cuts, abrasions, bites, stings, absorption of toxic material, inhalation of dusts, etc. Sturdy steel toed shoes are essential in animal confinement areas.
- Keep facilities and equipment in good repair. Inspect pens, chutes, stalls, fences, ramps and confinement devices regularly and repair promptly. Replace latching mechanisms on squeeze chutes when they become worn or do not function properly.
- Make sure ladders, steps, and flooring are sound, and that steps are equipped with a handrail.
- Make sure electrical machinery is properly installed, grounded, maintained, and shielded. Make sure equipment can be locked out during maintenance and use lockout procedures for maintaining the equipment. Starting switches should be convenient and in full view of others who may be working in the area.
- Keep power tools in good condition. Do not use them while standing in water or mud. Unplug tools and put them away when not in use.
- Only tools equipped with properly functioning ground fault interrupters (GFI) and manufactured for the specific use may be used in damp or wet places, and with stock water heaters. GFIs can be either a portable plug-in type or built into circuit breakers.
- Never enter a sealed silo or manure facility without adhering to all requirements of UNL's Confined Space Program. When agitating or pumping manure, open windows and doors and turn ventilating fans to maximum.
- Never enter a grain or feed bin when unloading is in progress or about to start. If entering, follow provisions in UNL's Confined Space and Lockout Tagout Programs.
- Store barn chemicals and pharmaceuticals in a secured, clean, cool, dry place.
- Keep doors and gates closed and locked when unattended.
- Heat lamps for brooding should be solidly supported and shielded.
- Install safety fencing around manure disposal lagoons.
- Never place tools, uncapped syringes, or other heavy materials on fences or chute bars (even temporarily) to prevent them from falling off and injuring an employee or animal.

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