

Animal Handling Safety Considerations¹

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Few farmers view livestock as a source of danger. Yet animal-related accidents cause numerous deaths and serious injuries each year. A recent National Safety Council study ranked beef cattle farms second and dairy operations third among all farming enterprises in injuries per hours of work. Seventeen percent of all farm injuries involved animals. This equaled the percentage of injuries caused by farm machinery.

Removing hazards brings you one step closer to a safe work environment. Whether you are operating equipment or working with animals, taking a few precautions and observing safety rules can save you precious time, prevent injury, or even save your life.

GENERAL CONSIDERATIONS

Anyone who works with livestock knows each animal has its own personality. Animals sense their surroundings differently than humans. Their vision is in black and white, not in color. They also have difficulty judging distances. And differences exist between the vision of cattle, swine and horses. For example, cattle have close to 360-degree panoramic vision (Figure 1). A quick movement behind cattle may "spook" them.

Animals have extremely sensitive hearing and can detect sounds that human ears cannot hear. Loud noises frighten animals, and research proves that high-frequency sounds actually hurt their ears. These factors explain why animals are often skittish and balky, particularly in unfamiliar surroundings.

Watching animals for signs of aggressiveness or fear alerts you to possible danger. Warning signs may include raised or pinned ears, raised tail or hair on the back, bared teeth, pawing the ground or snorting.

Although handling methods may vary greatly for different types of livestock, there are some generally accepted rules for working with any animal:

- Most animals will respond to routine; be calm and deliberate.
- Avoid quick movements or loud noises.
- Be patient; never prod an animal when it has nowhere to go.
- Respect livestock - don't fear it!

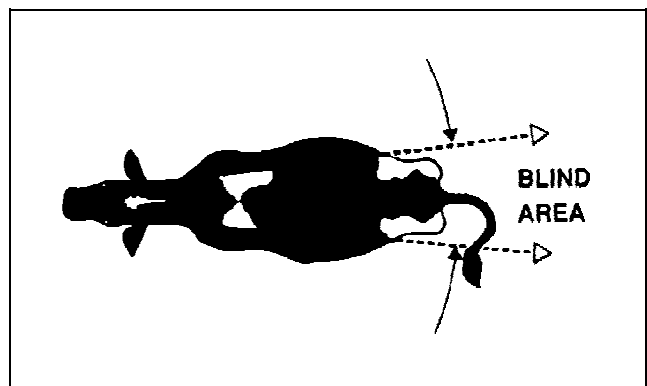


Figure 1. Cattle have panoramic vision; they can see everything except what is directly behind them

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- Move slowly and deliberately around livestock; gently touch animals rather than shoving or bumping them.
- Always have an escape route when working with an animal in close quarters.

FACILITIES

Many livestock handling injuries are directly related to equipment or building structures. Poor facilities and equipment can also cause injuries to animals. This can mean considerable economic loss at market time.

Tripping hazards such as high door sills, cluttered alleyways and uneven walking surfaces can cause serious injury and a considerable amount of lost work time. Studies have found that falls account for 18 percent of all animal-related accidents.

Concrete floors are best for livestock. The finish on concrete floors should be roughened to prevent slips under wet conditions. High traffic areas, such as alleyways, should be grooved. Floors should allow water to drain easily. Slatted floors often are used to keep animals dry in a confinement system.

Fencing and gates should be strong enough to contain crowded livestock. A variety of materials are available, but the key is strength and durability. A protruding piece of lumber, a nail or a bolt can cause painful and infectious injuries. If backed or pushed into, one of these objects can cause a serious back injury.

Alleys and chutes should be wide enough to allow animals to pass, but not wide enough to allow them to turn around. A width of 30 inches is recommended for a cow-calf operation. For cattle in the range of 800 to 1,200 pounds, a 26-inch width is recommended. Solid wall chutes, instead of fencing, will lower the number of animals that balk in the chute.

Lighting should be even and diffused. Bright spots and shadows tend to make animals more skittish, especially near crowding or loading areas. Animals move more readily from dark areas into light, but avoid layouts that make them look directly into the sun.

Handling equipment can speed up livestock confinement work operations, reduce time and labor requirements, cut costs, and decrease the risk of injury.

ANIMAL HEALTH AND HYGIENE

Hygiene is vital to good livestock management, particularly in confinement systems where diseases can spread quickly. Maintaining a clean, dry environment is obviously important, but other factors also are crucial.

Ventilation should minimize dust. Various molds that can cause respiratory as well as digestive problems may be present in feed. All feeds should be carefully checked before they are fed to livestock. Deal only with reliable feed dealers and have suspect feed tested.

ANIMAL DISEASES AFFECTING PEOPLE

All animals, domesticated or wild, can be a source of human illness and parasitic infestation. Diseases that can be transmitted between animals and people are referred to as zoonoses.

Rabies

Rabies is a deadly virus that affects the central nervous system. It can be transmitted by saliva from an infected animal through a bite, open wound or sore. Although widespread pet inoculation has greatly reduced the threat of rabies, rural people are at greater risk due to their proximity to wild animals. A veterinarian should be called to examine animals observed acting abnormally. Seek immediate medical attention if you are bitten by an animal that you suspect is rabid.

Lyme Disease (LD)

Lyme Disease (LD), while only a remote possibility in Missouri, is another potential threat. Although the tick species known to transmit LD are not present in the state, the organisms that cause LD have been found in the Lone Star tick, which is found in Missouri. It is not known at present whether this tick transmits LD to humans. It may transmit LD to animals, but is known to do so only in its nymphal stage when it is usually found on rodents, birds and feral animals such as deer.

If LD occurs, its symptoms may develop within 2 to 30 days of the tick bite. A small red bump appears near the bite and enlarges into a spreading red ring. This is followed by a general sickness, including fever, chills, headaches and backache. Some may experience palpitations, dizziness and shortness of breath.

LD responds well to antibiotics in its early stages, but if left untreated, it may advance into a chronic stage involving rheumatoid arthritis or cardiac problems.

Brucellosis (Bangs Disease)

Brucellosis (Bangs Disease) affects cattle, goats and swine. It can be transmitted to people in unprocessed milk, infected carcasses, or by an aborted fetus or afterbirth from an affected animal. Good sanitation practices reduce the chances that herds will be infected. Animals should be tested periodically for this disease.

Trichinosis

Trichinosis, caused by tiny parasites, can be painful and sometimes fatal to humans. It is transmitted by consumption of uncooked or partially cooked pork. Trichinosis has nearly been eradicated in North America. Thorough cooking is the best prevention.

Salmonella

Salmonella organisms are found in poultry and in wild and domestic animals. They can be transmitted to people through contaminated food or water. The disease can cause severe gastrointestinal distress and fever. Prevention includes proper storage and cooking of animal-derived foods. Good sanitation procedures when handling food reduce the risk of salmonella poisoning.

Other zoonoses also exist. However, preventive measures such as keeping animal facilities clean, testing and immunizing, and using sanitary practices in handling animals and their products minimize the danger.

MANURE PIT GASES

Toxic gases, especially in confined spaces such as manure pits, silos and grain bins, can pose hazards to humans and animals (Figure 2). Four gases of major concern can be found in manure pits. They are hydrogen sulfide (H₂S), ammonia (NH₃), carbon dioxide (CO₂) and methane (CH₄).

The primary health hazards of these gases are:

- Toxic or poisonous reactions that can occur in people or animals. Hydrogen sulfide is the most toxic of these gases.
- Oxygen depletion, which can result in asphyxiation. Hydrogen sulfide, ammonia and carbon dioxide gases are all heavier than air. During agitation of the pit and under conditions of poor ventilation, these gases will replace the oxygen in the air.

- Explosions that can occur when oxygen mixes with the gases. This is primarily a problem with methane.

Characteristics

Hydrogen sulfide:

- Most dangerous gas associated with waste decomposition.
- Distinct rotten egg smell; heavier than air.
- After breathing this gas a short time, sense of smell becomes fatigued and you may no longer be able to detect any odor. Gives a false sense of security. At low concentrations the gas irritates the eyes and respiratory tract; at moderate levels, causes headaches, nausea and dizziness; at high concentrations, death will occur.

Ammonia:

- Distinct, sharp, penetrating odor detectable at very low concentrations.
- Heavier than air.
- At moderate levels of concentration, can irritate eyes and respiratory tract; at high concentrations, can cause ulceration to the eyes and severe irritation to the respiratory tract.

Carbon dioxide:

- Odorless, heavier than air, difficult to detect.
- Primarily replaces oxygen in air and acts as an asphyxiant. At moderate concentrations, shortness of breath and dizziness can occur.
- A major contributing factor to animal deaths by asphyxiation in confinement buildings, which often occurs during ventilation failure.

Methane:

- Odorless and lighter than air, so it tends to accumulate near the tops of manure pits.
- Considered an asphyxiant at extremely high concentrations. Main hazard is its flammable, explosive nature.

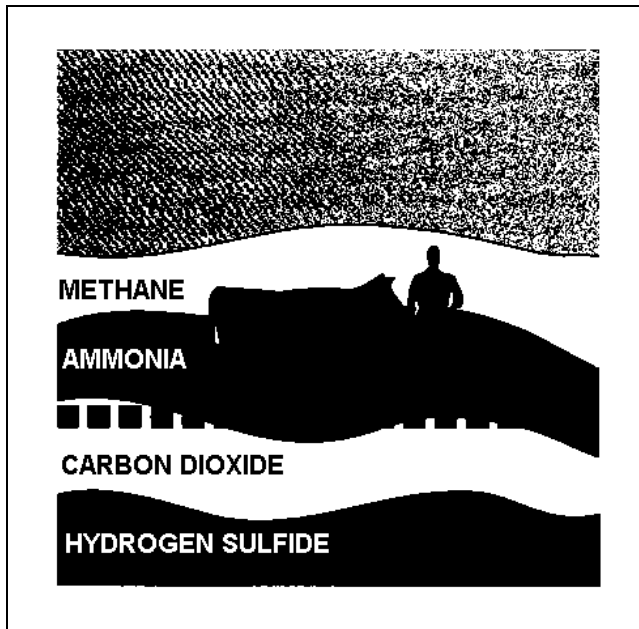


Figure 2. Toxic gases are generated during manure decomposition.

PREVENTION

Under normal conditions in a well-designed, properly constructed building with good ventilation, you should not have many problems with gas accumulation. But serious problems can occur if the proper precautions are not followed.

- Provide as much ventilation as possible in the pit and building during agitation of the waste. Although pits are agitated only a few times a year, most human and livestock deaths or illnesses occur at these times.
- No workers should be near the pit or in the building during agitation. If possible, remove all animals from the building.
- Avoid entering a manure pit at any time, if at all possible. Even if the pit has been emptied, it still may be lacking in oxygen or have high concentrations of toxic gases.
- Always keep at least one foot of space between the highest manure level and the slats. This protects the animals who lie on the slats and inhale the gases that will accumulate at the surface of the pit.

SILO GASES

Grain, particularly corn, can accumulate high amounts of nitrates. During the first 24 to 48 hours of fermentation, significant amounts of nitrogen dioxide (NO₂) can be released (Figure 3). When this gas is inhaled by silo workers, it can cause a severe chemical pneumonia known as "silo filler's disease."

Nitrogen dioxide is one of the most hazardous lung irritants. It has a pungent, sweetish odor, even in low concentrations of 5 parts per million (ppm). It has a reddish-brown color, visible only when concentrations reach a dangerous level (75-150 ppm). It is heavier than air and can settle at the bottom of enclosed spaces.

Any concentration over 25 ppm can be hazardous. The effect on the lungs is often so subtle that the victim may not realize the serious nature of the exposure until too late. Inhalation of 50 to 75 ppm for 30 to 60 minutes can cause bronchitis; 50 to 100 ppm causes chemical pneumonia; 150 to 200 ppm, a severe fibrosis type of pneumonia; 300 to 400 ppm, severe lung damage, fatal in 2 to 10 days; over 500 ppm, acute pulmonary edema, fatal in less than 48 hours.

PREVENTION

- Do not allow anyone to enter the silo during the filling process until the blower has run for at least 30 minutes. The height of the chute doors should be kept as close as practical with the silage level. This allows heavier-than-air gases to be blown down the chute.
- Do not for any reason allow anyone to enter the silo for 7 to 10 days after the filling process is completed. It is during this time that the fermentation process is occurring and producing the toxic gases.
- Provide good ventilation around the base of the silo during the fermentation process so that the gases will be carried away.
- Provide fencing to prevent children and animals from straying into any spaces adjoining a silo during this dangerous period.
- When the silo is opened, the blower again should run for a minimum of 30 minutes before entry. Given a proper fermentation, no further gas production should occur.

- Never enter a silo without someone on the outside monitoring your activity.

For information about grain storage, see MU publication G01969, Safe Storage and Handling of Grain.

DUSTS

Dusts are the most common danger in the air when working around livestock. Some types of dust are more dangerous than others. But all dust can cause serious health problems to an individual, depending on the amount, type and length of exposure.

Some dust carries antigens that cause severe irritation to the respiratory tract and lungs. This often results in lung damage. The most common form is known as "farmer's lung." It results from breathing moldy forage or grain, normally hay. Farmer's lung is one of the most disabling diseases among dairy farmers.

Farmer's lung symptoms often are not noticed until several hours after exposure to the dust. Symptoms often are mistaken for bronchitis or pneumonia. If the disease is not diagnosed early, irreversible lung damage and sometimes death can result.

Farmer's lung will limit the amount of work a farmer can do because shortness of breath will require frequent rest periods.

"Nuisance dust" is the term for other forms of dust that are often inhaled while working with livestock. Breathing dusty air of this type for long periods will cause areas of your lungs to become hardened and

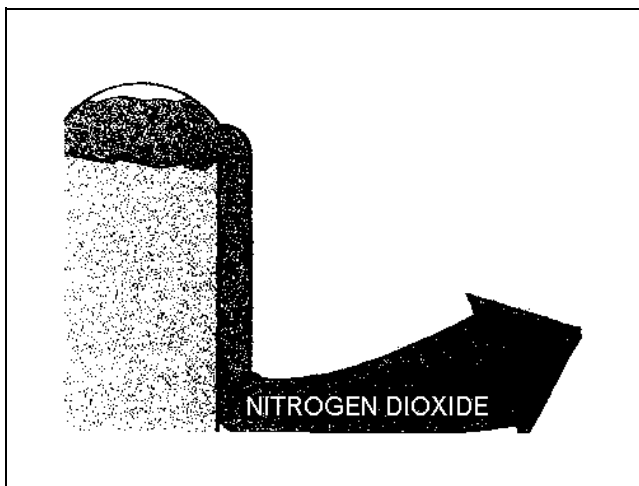


Figure 3. Heavier than air, nitrogen dioxide travels down the silo chute to the outside.

inelastic, and your capacity to take in needed oxygen will be reduced. Furthermore, your susceptibility to respiratory diseases like pneumonia may increase.

PREVENTION

- Store only dry, well-cured forage or grain. Mold develops from the heat generated by moist or wet stored forage and grain.
- Burn moldy grain or hay.
- Keep livestock areas as clean as possible to prevent dust from collecting.
- Wear a dust mask in dusty work areas to keep harmful dust out of your lungs.

PERSONAL PROTECTIVE EQUIPMENT

Foot injuries are frequent in all types of livestock facilities. Wear safety shoes or boots. Composition and type of sole configuration also are important to combat the problems of uneven and wet footing.

If you must enter a manure pit or silo without a self-contained breathing apparatus, turn on all forced ventilation equipment for a minimum of 30 minutes.

Wear a harness or tie a rope around your waist and have at least one person holding the lifeline. If you are overcome by the gas, this lifeline is your only means of rescue without endangering other people.

A self-contained breathing apparatus is recommended, but its high cost may make it impractical to have this equipment readily available on most farms.

SAFETY REMINDERS FOR LIVESTOCK HANDLING

- Liquid manure holding facilities should be secured against entry. Outdoor lagoons and ponds should be fenced.
- Good housekeeping is essential, not only for your personal safety, but also for the health and well being of your stock.
- Keep children away from animals, particularly in livestock handling areas.

- Most male animals are dangerous. Use special facilities for these animals and practice extreme caution when handling them.
- Be calm and deliberate when working with animals. Always leave yourself an "out" when working in close quarters.
- Respect all animals. They may not purposely hurt you, but their size and bulk make them potentially dangerous.
- Most animals tend to be aggressive when protecting their young; be extra careful around newborn animals.
- Stay clear of animals that are frightened or "spooked." Be extra careful around strange animals.
- Monitor entry into your operation; sales and service personnel could bring diseases from other farms.
- Keep facilities in good repair. Chutes, stalls, fences and ramps should be maintained regularly.