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## Respiratory Hazards

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### Introduction

Respiratory hazards are among the most dangerous of all hazards found in pork production facilities. While people and animals can live days without food and water, they can survive only seconds without air. Preventing exposure to respiratory hazards is extremely important for both employees and employers.

There are several potential respiratory hazards found in pork production facilities. Respiratory hazards are classified as either chronic or acute. A chronic hazard causes damage to a worker's lungs and other parts of their body over long periods of time; an acute hazard can affect a worker's health immediately after exposure.

### OSHA Rule(s)

As had been described in the Federal Register, OSHA's 1910.134 is generally not enforced in agricultural operations unless state standards are MORE stringent than the federal counterparts.

"OSHA did not propose to expand coverage of 29 CFR 1910.134 to agricultural workplaces covered by 29 CFR part 1928, and this final Respiratory Protection standard, like the proposal, does not apply to agricultural operations. The prior standard likewise did not apply to agricultural operations. (See 29 CFR 1928.21.) OSHA received no public comment requesting a change in coverage. Accordingly, the issue of respirator use during agricultural operations was not a part of this rulemaking. OSHA notes, however, that respirator use during pesticide operations and handling is covered by EPA's Worker Protection Standard, 40 U.S.C. part 170, adopted under the authority of the Federal Insecticide, Fungicide, and Rodenticide Act, as amended (7 U.S.C. 136- 136y)."

### Hazard

The most common airborne hazards are dusts, vapors, and gases. Dust exposure may not be harmful in small amounts. However, dust is found almost everywhere, and may contain multiple hazardous components. For example, dust in a pork production facility may be composed of animal dander, hair, manure, feed particles, bacteria, and other biologically active components.

The most common vapor found in hog facilities is ammonia. Ammonia is colorless with a sharp, distinctive odor. Ammonia can cause irritation of the eyes, throat, and lungs of workers even at low exposure levels.

Several hazardous gases can be found in hog facilities. Gases can cause poisoning or asphyxiation depending on the type.

- Hydrogen sulfide is a poisonous gas that smells like rotten eggs. Hydrogen sulfide is often found in manure pits, and can cause unconsciousness and death even at low levels.
- Carbon dioxide is a colorless gas that is also associated with manure pits. Carbon dioxide can cause panting and dizziness at high concentrations.
- Methane is a colorless, odorless gas that is flammable and poses an explosion hazard.
- Carbon monoxide is a colorless, odorless toxic gas that can build up in poorly ventilated areas and cause death. Carbon monoxide is usually produced by a fueled heater or engine being used indoors.

## Prevention & Control

This section deals only with respiratory hazards that a worker would most likely encounter inside a typical production building during normal working situations. Gases and other hazards found inside manure pits, bins, silos, and other confined spaces are covered in the confined spaces section.

Producer employers must help protect workers from respiratory hazards. As with any hazard, it is best to locate the source(s) of the contaminant in the air and control or minimize its release at the source. For example, dust levels from feed can be controlled by minimizing the “drop” distances when feed is moved from one area to another such as being dropped from a conveyor into a feeder. Contaminants (particularly gases and vapors) can also be controlled through ventilation. Pork producers may wish to learn about methods and tools used to measure levels of vapors and gases; ventilation can then be designed to reduce the level of respiratory hazards in the building.

Respiratory protection equipment is also a foundation for protecting workers but should never be viewed as a replacement for control at the source or proper ventilation! Within buildings, most workers will need access to “air purifying” respirators. It is the employer’s responsibility to provide this equipment. Respirators include two-strap dust masks; cartridge respirators for filtering out low concentrations of ammonia vapor; powered air-purifying respirators (PAPRs); or gas masks that can filter out slightly higher concentrations. Many farm supply catalogs which specialize in safety-related equipment can help you make the best selection.

Air purifying respirators absolutely must not be used in manure pits or other confined spaces where you are likely to have HIGH levels of toxic gases or low oxygen levels (below 19.5%). These are environments where an air-supplying respirator is needed (such as a self-contained breathing apparatus). All respirators used in your operation must be NIOSH-approved, and must be selected to match the type and concentration level of the hazard. Wearing the wrong respirator or using a respirator in a situation with high concentrations of toxic gases or a lack of oxygen can result in death.

Respirator use in many industries is regulated by OSHA. OSHA requires the following in their 29 CFR 1910.134 standard:

- Written standard operating procedures for the safe and proper use of respirators (employees should have knowledge and understanding of these procedures);
- Fit testing;
- Training of supervisors and employees;
- Evaluation of the employee by a licensed health professional;
- Inspection, cleaning, maintenance and storage [you are required to use NIOSH (National Institute for Occupational Safety and Health)-approved respirators. A respirator is NIOSH-approved if it is engraved with a “TC” approval number, such as TC-23C];
- An evaluation (at least annually) of your program;
- One program administrator (responsibility for program administration should rest with one person).

Other requirements and clarifying material can be found within the standard and other clarifying material is located here. (<http://www.osha.gov/dcsp/ote/trng-materials/respirators/faq.html>)

## Summary

To minimize respiratory hazards to humans in swine operations minimize exposure to dust and hazardous gases. Also use personal protective equipment for respiratory health and safety.

To prevent chronic respiratory illness due to dust DO:

- Control and reduce dust by regularly washing down your facility.
- Wear a dust mask to filter dust from the air you breathe.
- Improve the air quality in your facility by bringing in fresh air from outside.

To prevent acute respiratory illness due to gasses DO:

- Dilute toxic gases by maintaining proper ventilation and bringing fresh air from the outside into the contaminated area using fans and opening curtains, doors, and windows.
- Use a supplied-air respiratory if you must enter an area where toxic gases are suspected to be at a hazardous level.
- Make sure your respiratory fits properly.

To prevent chronic respiratory illness due to dust DON'T:

- Wear a dust mask that doesn't fit you properly.

To prevent acute respiratory illness due to gasses DON'T:

- Enter an area in which hazardous levels of a toxic gas are suspected.
- Wear a respirator that doesn't fit you properly.
- Wear a respirator that has not been approved for the specific hazard you are protecting yourself against.
- Enter a confined space without authorization, alone, or without proper equipment.

## Additional Resources

Small Entity Compliance Guide ([http://www.osha.gov/Publications/SECG\\_RPS/secgrev-current.pdf](http://www.osha.gov/Publications/SECG_RPS/secgrev-current.pdf))

This OSHA document discusses the major requirements of OSHA's Respiratory Protection Standard, 29 CFR 1910.134 ([http://www.osha.gov/dcsp/ote/trng-materials/respirators/major\\_requirements.html](http://www.osha.gov/dcsp/ote/trng-materials/respirators/major_requirements.html))

OSHA Respiratory FAQ (<http://www.osha.gov/dcsp/ote/trng-materials/respirators/faq.html>)

NASD Proper use of a respirator (<http://www.cdc.gov/nasd/docs/d000101-d000200/d000111/d000111.html>)

Proper use of a respirator (<http://www.cdc.gov/nasd/docs/d000101-d000200/d000111/d000111.pdf>)

Slideshow of OSHA Respiratory Protection (<http://www.osha.gov/dcsp/ote/trng-materials/respirators/presentation/index.html>)

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