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SILO GAS

COMMONLY ASKED QUESTIONS

What you know about silo gas could save a life. Here are answers to some of the most commonly asked questions about this dangerous gas.

National Farm Medicine Center

WHAT IS SILO GAS?

Silo gas is actually nitrogen dioxide, an extremely toxic, yellowish-brown gas with a bleach-like odor. During the fermentation process, oxygen combines with nitrates in plant materials resulting in the production of nitric oxide gas. This combines with oxygen in the environment to produce nitrogen dioxide.

WHEN AND WHERE IS SILO GAS PRESENT?

The gas can form from a few hours to three weeks after materials are put in the upright silo. It is heavier than air, so it settles at low points in the enclosure. High levels of nitrogen gases also occur in silage bags and covered bunkers. Nitrogen levels in silage may be higher during times of prolonged drought and rain just before ensiling or if excessive fertilizer was applied.

WHY IS SILO GAS DANGEROUS?

When nitrogen dioxide is inhaled and comes in contact with the moisture in your lungs, it actually forms nitric acid. This acid causes chemical burns of the airway and lungs, and sometimes complete asphyxiation. Silo gas acts very fast – many people inhale it and never regain consciousness. Those who do survive often have permanent disability because of scarring of the lung tissue.

WHAT ARE THE SYMPTOMS OF SILO GAS EXPOSURE?

Coughing, burning in the throat, shortness of breath, chills, fever, headaches, nausea, or vomiting can occur from 3 – 30 hours after even a mild exposure. Fluid build-up that occurs in the lungs after the exposure can be fatal. If you know someone that has been exposed to silo gas, have them see a doctor immediately. Early treatment can improve a person's chance of survival. If a person has difficulty breathing or is not alert after an exposure, medical assessment at a clinic or hospital is recommended.

Remember, silo gas is heavier than air, quick and deadly – by the time you see it or smell it, it may be too late.

WHAT CAN I DO TO PREVENT EXPOSURE TO SILO GAS?

The only sure way to prevent exposure to silo gas is to stay out of the silo for at least the first three weeks after filling, unless trained in the use of a self contained breathing apparatus (SCBA) and approved confined space entry procedures to protect yourself. If you don't have specific training in confined space entry, get the help of your local fire department or emergency trainers.

If it is absolutely necessary to enter a silo in the first three weeks, the recommendations are to wear a SCBA and monitor the environment for nitrogen gases. Gases can be monitored using a one-time use detector tube or continuous reading meters. Once the silo is filled, leveling or capping should be completed immediately. If this can't occur, the same day, one load should be saved to add prior to leveling or capping.

If recently filled silos are entered without those precautions, then the doors should be opened and the vents run for at least 30 minutes prior to entering and continually while in the confined space. Family members or co-workers should be notified and ready to observe and call 911 if the person goes down. Observers should not enter themselves to perform a rescue. This is not recommended and is not a fool proof method as farmers have been seriously injured even when these precautions have been taken. It is also important to ventilate any structures that connect the silo with areas that house animals and workers.

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For more information, call us at 1-800-662-6900 or visit our web site at http://www.marshfieldclinic.org/nfmc

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