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1977

## Health Risks of Forage Handling

Cooperative Extension South Dakota State University

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### Recommended Citation

South Dakota State University, Cooperative Extension, "Health Risks of Forage Handling" (1977). *SDSU Extension Fact Sheets*. 472.

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# Health Risks of Forage Handling



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# Health Risks of Forage Handling

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Farmers can contract two potentially serious diseases from forage or fodder used to feed livestock. The two diseases are farmer's lung and silo filler's disease.

## Farmer's Lung

Example: The 33-year-old farmer had a severe cough, fever, and complained of shortness of breath. He thought it was pneumonia, but doctors at the hospital diagnosed it as "farmer's lung."

### The danger

The disease of the farmer was caused by tiny mold spores (known scientifically as thermophilic actinomycetes) that grow in moist hay and grain stored with little ventilation. Spores can be present in bales of wet hay 4 to 6 days after baling. But it is when the bales are opened in the winter and the dangerous spores are set free to pollute the environment that farm workers and livestock are exposed to serious risk. When the farmer inhales the "white dust" that contains these mold spores, his lungs may become abnormally sensitive to the tiny organisms, and he may develop farmer's lung.

### How the mold is produced

To produce mold spores in sufficient quantity to infect the farmer or his livestock, two conditions must be present:

1. When the hay is baled, the moisture content must be greater than 30%.
2. The wet hay, once baled, must be stored in a warm environment. Usually the mold grows on hay, but it can also grow on other fodder such as straw, or even grain.

### Symptoms

Typically, the initial attack is signaled by rapid onset of general discomfort with a splitting headache, pronounced shivering, and a feverish condition where the temperature might rise to 103 F. These symptoms usually occur quite suddenly, some 6 to 8 hours after exposure to the dust of moldy hay.

Perhaps the most characteristic symptom is a type and degree of breathlessness out of all proportion to the other symptoms. This is usually accompanied by a phlegm producing cough. Although the other symptoms subside quickly, the breathlessness may persist for several weeks, improving only slowly with

treatment until recovery 2 or 3 months later.

### Treatment

Treatment with steroid drugs has produced dramatic results in certain cases, but most doctors don't like to treat the disease with these drugs on a long-term basis.

These drugs relieve the patient's symptoms, and he usually feels much better. However, unless he stays away from the mold, the disease can continue even though he is being treated. At present, the only real cure for farmer's lung is to keep away from the mold responsible for the disease.

### Outlook

Once the initial symptoms have occurred, it must be realized that the patient remains in a highly susceptible condition.

Any subsequent exposure to a moldy hay environment causes recurrent symptoms with progressively delayed recovery. If exposure is chronic and the condition is left untreated, it can lead to irreversible lung damage and eventually cause conditions such as emphysema.

### How to reduce hazards

- Face masks and respirators are of little use. (Mold spores pass right through ordinary face masks.)
- Use dryers or barn dry the fodder to reduce the moisture content.
- Chill the fodder to below the minimum temperature of growth of the mold spores (usually not very practical).
- Apply chemicals such as propionic acid to prevent the mold spores from multiplying.
- The only real cure for the condition, once it has developed, is complete and permanent removal from exposure.

## Silo Filler's Disease

Example: The silo had been filled 3 days earlier with high-moisture corn, and the farmer went to check on it. His wife found him, sick to his stomach, gagging, and gasping for breath.

The relative scarcity of reported cases of silo filler's disease suggests that the condition is rare, at least in its life-threatening form. Nonetheless, the large

number of fatalities and the fact that the disease is entirely avoidable make it important.

### The danger

Silage fermentation may produce several kinds of gases. One of these is nitric oxide which combines with oxygen in the air to produce nitrogen dioxide.

Nitrogen dioxide is poisonous. When inhaled, it kills and injures people and livestock. This lethal gas is yellowish-brown and smells like some laundry bleaches.

### How does the gas form

It develops from nitrogen compounds in silage. It is particularly prevalent in silage made from forage grown under stress, such as drought, and ensiled when immature. It may be increased with heavy nitrogen applications to the forage crop. Heating of the silage speeds up the production of nitrogen dioxide. Less is produced with lower moisture silage.

In vertical silos, heaviest gas production usually is within the first 3 to 4 days of silo filling and up to 2 weeks after. Packing or covering of the silo top tends to hold the gas in the silo. There is little danger in open, pit-type silos since they are naturally ventilated in the open air.

### Symptoms

Initial symptoms include shortness of breath, irritation in breathing, unusual tiredness and nausea if a high concentration of gas is inhaled, and coughing.

### Treatment

Treatment, after removing the victim from the area of the silo, is to call the emergency service and specify that oxygen is needed. Keep the patient comfortable until the doctor or ambulance arrives.

It is important that the victim seek immediate medical attention regardless of the degree of the symptoms. If treatment is not given, a relapse could occur, ultimately leading to permanent lung damage.

The majority of people who develop initial poisoning symptoms do go on to develop further symptoms. Either complete recovery or a final permanent condition characterized primarily by persistent shortness of breath on even mild exertion or death may occur.

**How to reduce hazards**

- Keep out of silo during filling. Do not tramp silage.
- Close all doors before putting in any silage.
- Go up outside ladder to level off silage in silo.
- Remove doors down to silage when finished if silo is not completely full.
- Check fresh silage on steps in chute. Stains indicate presence of nitrogen

dioxide. If unstained for 2 days, gas is probably gone.

- If going into silo when gas is present, be certain the silage filler blower has been on for at least 15 minutes. That should provide adequate ventilation. But stay for only a short period and be certain someone is nearby. (Portable oxygen breathing equipment would be especially advantageous.)
- Tie rope to silo cover so you can pull

the cover off 2 days before starting to use the silage.

Second in a series of fact sheets on rural emergency health care being prepared cooperatively by USD and SDSU. Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with USDA. Hollis D. Hall, Director of Cooperative Extension Service, SDSU, Brookings. Educational programs and materials offered without regard to age, race, color, religion, sex, handicap, or national origin. An Equal Opportunity Employer.

File: 10.5-1—3M-77—3,000 reprinted at estimated 5 cents each—8-79mb—4748A.

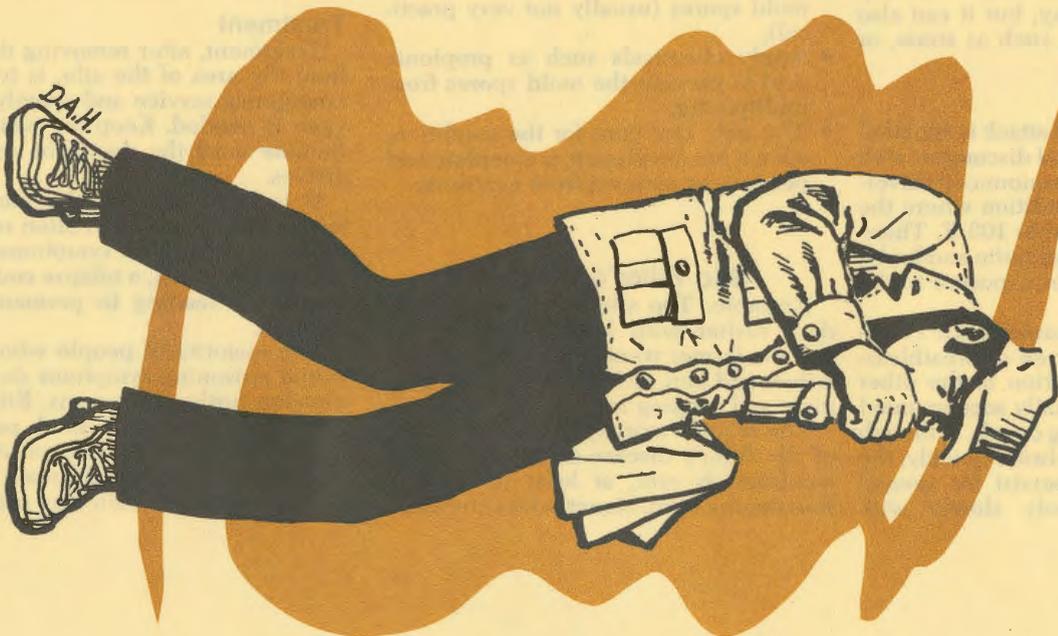
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