

Causes and Symptoms of Mold and Dust Induced Respiratory Illness

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Introduction

Who Needs to Know About Respiratory Illnesses?

- those working in dusty fields or buildings
- those handling moldy hay
- those working in silos
- those feeding or working with feedstuffs
- those working in corn silage
- those uncapping silos
- those cleaning grain bins
- those exposed to bird droppings or feather, hair, or fur dust
- those exposed to fish meal

Farmers account for more than 30% of adults disabled by respiratory illness, yet a large percentage of farmers are nonsmokers. If you work in any one of these situations, then you need to be aware of Farmer's Lung as well as other respiratory hazards.

Farmer's Lung is only one of the respiratory hazards for farmers, but it is a serious one. The number of farmers affected has also been increasing in recent years. This results from a growing awareness among farmers and that they have been seeing their physicians more frequently. The larger size of silos accounts for much of the increase.

What is Farmer's Lung?

Farmer's Lung is a noninfectious allergic disease caused by inhaling dust from moldy hay, straw or grain. It is a disease because the body reacts to the invading contaminants (mold spores) which the body's immune system cannot counteract.

The lungs allow oxygen to enter the bloodstream and carbon dioxide to exit the bloodstream. They are the location for a vital process for good health; but they are also the quickest and most direct route for hazardous contaminants to enter the body and the bloodstream. The results from exposure to mold spores can be so debilitating that some farmers are even forced to leave the occupation completely.

What are These Mold Spores and Why are They so Dangerous?

Mold spores are tiny bacteria less than 4 microns in size -- so small that as many as 250,000 spores can fit on a pin head and a farmer can inhale as many as 750,000 of these spores per minute! They are produced by microorganisms which grow in moist hay and stored grain silage where the moisture content is high (30%) and the area is poorly ventilated.

When farmers move or work with hay and silage materials in which mold spores have grown, the mold spores attach themselves to airborne dust particles. The farmer not only inhales dust particles which may not be extremely hazardous, but he also inhales mold spores which are a serious hazard. Heavy concentrations of mold spores appear as dry, white or grey powder or clouds.

The body has natural defense filtering systems (such as mucous lining, coughing and sneezing) against dusty air which helps remove some contaminants, BUT most contaminants overpower and pass through these defenses. Mold spores not only bypass defenses because of their number, but also because they are so small.

Very fine particles, like mold spores, move into, accumulate and settle into the lower lungs. There they produce toxins. Remember that the lungs transfer oxygen to the bloodstream, and most of the actual exchange of carbon dioxide and oxygen takes place in the lower lungs. Now the lungs become a roadway for toxic materials to travel through the bloodstream with the oxygen. The body's reaction to the toxins permanently affects the lungs' ability to transfer oxygen into the bloodstream. The lung tissue becomes permanently scared and each exposure to mold spores increases the damage.

The body's last defense against these tiny invaders is to develop an allergy producing cold or pneumonia-like symptoms.

Symptoms of Lung Disease and State of Illness

The farmer will develop specific symptoms based upon the intensity of dust and spores to which he has been exposed or the intensity of his body's reaction to the dust and spores. He is also likely to develop an increased sensitivity to mold exposure, having more severe reactions with fewer exposures. In all cases, each exposure aggravates the problem.

Acute State

This is the most noticeable condition which typically begins 4 - 8 hours after exposure. Most farmers ignore the symptoms because they are so similar to a common summer cold.

Typical Symptoms:

- fatigue
- chills
- shortness of breath
- tightness in the chest

Subacute State

This is a more serious condition because symptoms will be stronger and remain longer even with no further exposure to moldy dust particles.

Typical Symptoms:

- severe shortness of breath with any exertion
- headache
- irritating cough

Chronic State

This is the most serious condition because of its gradual onset and its long-lasting debilitation. At the chronic state, the disease becomes irreversible.

Typical Symptoms:

- chronic coughing
- progressively increasing and severe shortness of breath with even the slightest exertion
- physical weakness
- occasional fever and sweating at night
- appetite depression
- general aches and pains

Typically farmers develop chronic Farmer's Lung slowly over time after repeated exposure to mold spores because they continue to ignore the symptoms of acute attacks. However, it is possible to develop Chronic Farmer's Lung even after one acute attack.

A delay in seeking medical help damages the farmer most. Often, by the time a farmer sees a physician, there is already serious, permanent damage. And in some cases scar tissue (pulmonary fibrosis) develops, further interfering with the normal functions of the lungs.

How to Tell if You Have Farmer's Lung

Self diagnosis is not recommended. Always check with your physician to confirm your suspicions. However, here are some ways to tentatively diagnose yourself:

- Have you experienced a sudden illness that developed a few hours after you handled moldy crop material?
- Do you have a chronic cough?
- Do you have a general feeling of tiredness or depression?

Medical Treatment

It is not enough to look at the list of symptoms and think that you may have Farmer's Lung. You need to see your family physician. The list only helps you recognize symptoms that might match and it is important not to ignore them.

When you see your doctor, there are several things you can do to help him/her diagnose you correctly. A doctor who is unfamiliar with farmers' illnesses or does not know you are a farmer can mistake the symptoms of Farmer's Lung for a cold, asthma, flu or even pneumonia, and incorrectly diagnose your illness.

Tell your doctor:

- you are a farmer and the type of farming you do
- if you have been exposed to moldy crop material
- what chemicals and/or dusts you work with

Then your doctor can do several things to confirm or disprove a tentative diagnosis.

- take a blood test
- take a chest x-ray
- administer a breathing capacity test
- examine lung tissue
- administer an inhalation challenge
- perform an immunological investigation
- perform lung function testing
- review clinical history

Farmer's Lung can be controlled in many ways. One way for your doctor to help control it is to give you symptomatic relief. But Farmer's Lung cannot be cured. Unfortunately, there is no way to determine in advance if you are immune.

Measures Farmers Can Take Farmers can control or even minimize the possibility of getting Farmer's Lung by several preventative measures:

Preventative Measures

- **identify contaminants and hazards in the work environment**
- **minimize the amount and type of contaminants in the work environment**
- **avoid exposure to contaminants and mold spores and dust from decayed grains and forages**
- **limit exposure to all contaminants**
- **operate within a controlled environment whenever possible (e.g., cab, control room, etc.)**
- **depend upon mechanical controls to remove air contaminants (e.g., fans, exhaust blowers, filters, etc.)**
- **have as much ventilation as possible in dusty areas**

- **move work outside whenever possible**
- **avoid dusty work in confined areas**
- **wear respirators, masks or other protective equipment**

Management to Prevent Mold Spore Growth

- **use mold inhibitors**
- **bale hay, ensile crops, harvest and store grain at recommended moisture contents**
- **dry grain properly before storage**
- **properly ventilate storage buildings**
- **crops should be adequately ventilated to cool them down.**
- **always use a plastic sheet to cap open silos (not plant material) holding down the edges with heavy weight (e.g. tires)**

When You Must Work With Moldy Materials

- **wet down feed before transferring to minimize dust**
- **convert to mechanical or automated feeding or feed handling systems**
- **wet down the top of the silo before uncapping ensiled material**
- **use some wetting techniques when cleaning out grain bins or other dusty areas**
- **use respiratory protection when handling moldy or dusty materials.**

If you decide to use some form of respiratory protection, then make sure you use the appropriate device for the work task. Most farmers wear dust masks to protect themselves from Farmer's Lung. This is the best and most cost-efficient protection unless you know you will be exposed to extremely high levels of moldy dusts or you already have developed Farmer's Lung.

Those who have Farmer's Lung should talk to their doctor about the type of equipment that will offer the most protection because every exposure increases the risk of serious permanent damage.

Also, for any device you choose, make sure it fits well and is properly maintained.

For more information about respiratory equipment, see your local extension office or the publication on "Respiratory Protection."

More Information About Farmer's Lung

The chances of acquiring the disease are the greatest in late winter and early spring. This is mainly because farmers feed the hay and grain materials which have had a longer time to develop mold. Also, during those

colder months, farmers are likely to feed baled hay inside, and mold spores stay in the air inside a barn much longer. The amounts of mold spores a farmer will breathe in such a confined space are much more concentrated. Unrolling large round hay bales also may release mold spores.

Other times to be more careful about dusts that may contain higher levels of mold spores are:

In late summer - while cleaning out grain bins before filling with new grain

In early winter- opening new silos may release mold spores from the top layer of silage.

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