

RESPIRATORY HAZARDS ON THE FARM

Do you handle grains or feeds that create dust? Do you keep hogs, chickens or other animals in buildings? Do you weld? Do you mix and spray chemicals to control pests? Have your cattle, horses or other animals ever been sick? Do you know what made them sick? Could the disease be transmitted to humans?

If you said 'yes' to any of the above questions, then you are potentially at risk. If you plant, nurture and harvest crops, care for animals and perform tasks such as welding and applying chemicals, you are exposed to agents that can be harmful to your lungs.

This fact sheet will discuss your respiratory (breathing) system, its natural defences, diseases resulting from lung hazards on the farm and how smoking combined with lung hazards increases your risks. Learning how to prioritize control measures will reduce your hazards.

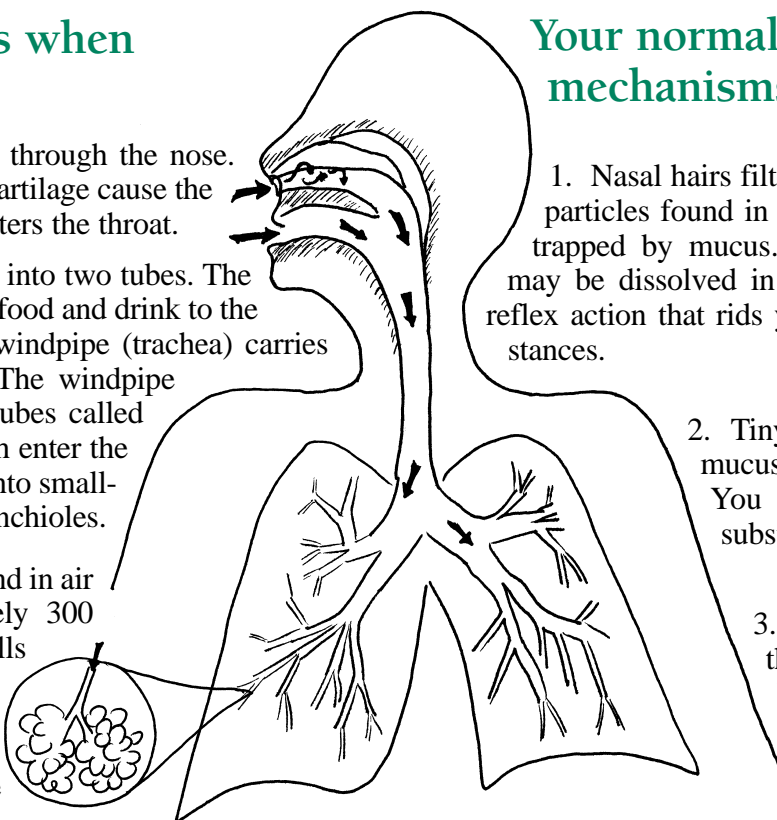
The Respiratory System

You inhale about 20,000 litres of air every 24 hours. During hard physical work, up to 10,000 litres of air may be inhaled within eight hours. Our lungs work hard every day!

Your body has defence mechanisms that clean inhaled air. Some of these may be bypassed when you work strenuously.

What happens when you breathe?

1. Air is breathed in through the nose. Small bones and cartilage cause the air to swirl. Air enters the throat.
2. The throat divides into two tubes. The esophagus carries food and drink to the stomach and the windpipe (trachea) carries air to the lungs. The windpipe divides into two tubes called bronchi. They each enter the lungs and divide into smaller tubes called bronchioles.
3. The bronchioles end in air sacs (approximately 300 million!) with walls thin enough to allow gases to be absorbed into and released from the bloodstream.



Your normal defence mechanisms

1. Nasal hairs filter out large particles. Some particles found in dust, fumes and smoke are trapped by mucus. Some vapours and mists may be dissolved in the mucus. A sneeze is a reflex action that rids your nose of irritating substances.
2. Tiny hair-like structures sweep mucus to the back of the throat. You swallow mucus and any substances dissolved in it.
3. A cough is a reflex action that rids your windpipe and bronchi of mucus and dissolved or attached substances.

Tiny particles of dust, not visible to the human eye, may bypass normal defences and end up in the lungs. Inhaled chemical vapours, gases and mists enter the bloodstream too, and are carried to all parts of your body.

How Lung Disease Occurs

Diseases that affect lungs and airways may be acute (short-term) or chronic (long-term). In acute illness, the farmer becomes ill after breathing in a harmful substance. Either recovery (for example, from bronchitis) or death (for example, after inhaling gas from a manure tank) occurs. In chronic illness, hazardous substances have affected the farmer's lungs and airways, causing permanent changes. Some hazards affect the lungs for a long time before signs of disease are noticed. By the time the disease is diagnosed, the farmer may face a lifetime of breathing problems.

A survey of Saskatchewan farmers showed they experience symptoms of lung disease more frequently than non-farmers.

	<u>Farmers</u>	<u>Non-farmers</u>
Morning phlegm	15%	9%
Chronic phlegm	11%	8%
Wheeze	27%	10%
Shortness of breath	33%	18%

Farmers may have worse symptoms when:

- ◆ Working in a confined space
- ◆ Buildings are closed during winter
- ◆ They are exposed to high concentrations of dust, mist, vapour, fumes or gases
- ◆ Exposure has occurred for many years

Monitoring Your Lung Health

It is important not to ignore symptoms like those above. Tell your doctor all the facts: When did the symptoms start? What were you doing that day? Do your symptoms ever improve or are they present all the time?



Everyone who works in agriculture should have a baseline pulmonary function test (simple breathing test). Later tests, when compared with the baseline, may show changes in your lungs that could indicate damage to them.

Respiratory Disease Conditions

Acute Inflammation

“My eyes are always red and my throat is sore after I handle canary seed.”

The mucus membranes become irritated resulting in a **sore throat and irritated nose and eyes**. It is experienced by grain handlers and poultry and hog confinement workers.

Allergies

“In haying season, my nose stuffs up and I have a rash on my arms.”

Sneezing, a runny nose, itchy eyes, sinus congestion and skin rash can all be symptoms of allergy. In a Saskatchewan study, 8.6% of farmers reported having been told they had allergies. Their bodies had become sensitized to trees, plants, pollen, mold or animal dander. Allergies can reduce the body's resistance to infections such as colds, flu and pneumonia.

Chronic Sinusitis

“My head feels full and my nose is always plugged.”

As a result of an inflamed nose, throat and sinuses, the air pressure valve between the outer and middle part of the ear does not function properly. Symptoms include a runny nose, congested sinuses and popping ears. Other complaints may include headache and dizziness. Hog barn workers often experience chronic sinusitis.

Bronchitis

“My cough and phlegm never go away. People are always asking me if I have a cold.”

Bronchitis is the most common complaint of farm workers. When the bronchial lining becomes inflamed due to irritation or disease, excess mucus is produced. The result is **frequent coughing with phlegm**. There may also be a **tight chest, shortness of breath and wheezing** and in acute bronchitis, a **fever**. Chronic bronchitis develops gradually, becomes worse with colds and other respiratory infections, and is strongly associated with smoking. Bronchitis is considered chronic after two years if the farmer has cough and phlegm more than 50% of the time.

Increased Airways Reactivity

“While shoveling grain, I began to feel sick.”

Symptoms include a **burning sensation in the nose and throat, chest pain or tightness, shortness of breath, cough, or wheezing** within minutes or hours after being exposed to high concentrations of dust.

Increased airways reactivity often accompanies bronchitis.

Asthma

“It felt like someone was squeezing my chest and I couldn’t get air.”

Asthma affects 5 % to 10% of the population and is related to family history but to a much greater degree, the environment. It often appears in childhood but can develop later. The affected person becomes sensitized to allergens such as house dust mites, animals, pollen and grain dust. Even low levels of an irritant can cause an asthma “attack.”

In an “attack,” the airways constrict, swell, and may spasm. Thick mucus is produced. Resulting symptoms may include a **tight chest, wheeze, shortness of breath and coughing or gagging**. The reaction can occur quickly or be delayed (6-8 hours). Sometimes both reactions occur.

Triggers for an asthma attack are different for each person. Common triggers are cold air, strenuous exercise, a strong emotion, a pre-existing cold or flu, or exposure to the allergen.

Occupational Asthma

On the farm, due to months or years of exposure, asthma may develop when a person has become sensitized to allergens such as grain dust, mold, storage mites or farm chemicals. One study found wheeze (a marker for asthma) present in 27% of Saskatchewan farmers but only in 10% of non-farmers.

Occupational asthma is usually ‘new’ but occasionally it can occur in people who already have had asthma. Less commonly, occupational asthma can be caused by a single very high level of an irritant, usually the result of a spill or leak. Symptoms start within 24 hours of the exposure and may continue for months or years. Being re-exposed to small amounts of the irritant will not usually trigger asthma symptoms.

Organic Dust Toxic Syndrome (ODTS)

“After we shovelled out the moldy grain, I went home and was so sick that night. The fever and chills lasted a couple of days. My neighbour helped me and was sick also.”

This illness occurs after exposure to large amounts of dust from moldy grain or silage. It is often mistaken for a flu and lasts 2-5 days. Initial symptoms include **burning eyes and throat, a headache, and a cough**. Four to six hours later, there may be **fever and chills, cough, muscle aches, chest tightness, general discomfort, weakness, and shortness of breath**. Often more than one person in a group will become ill and

further attacks will happen in response to lower dust conditions. Summer and fall are the peak seasons for ODTS.

This condition is also known as “Grain Fever” or “toxic pneumonitis.”

Farmer’s Lung

“I just can’t take the dust anymore so my son feeds the cows in the winter. When I feed them, I get sick.”

Farmer’s Lung is a specific disease caused mainly by the immune system’s response to inhaling spores from molds found in hay bales. When damp hay heats in storage, molds and bacteria develop causing spoilage. By disturbing these molds, spores are released and inhaled. Farmer’s Lung is most common in areas where there is heavy rainfall during harvest, and where there is a cold winter. High risk activities include breaking open bales indoors and feeding silage to cattle.

The acute form of this disease can be mistaken for Organic Dust Toxic syndrome. **Four to eight hours after exposure there may be weakness, fever and/or chills, shortness of breath, cough, a rapid heart rate and rapid breathing**. Sometimes symptoms are absent or mild. It may be confused with pneumonia and lasts 12 to 24 hours.

Symptoms worsen with each exposure. Smaller and smaller amounts of spores in dust will trigger a reaction in your body. Acute attacks may lead to the chronic form of Farmer’s Lung. There is a **gradual onset of cough, phlegm, mild fever and occasional chills, and shortness of breath**. Symptoms may also include **difficulty breathing, weight loss and increasing weakness**.

It is important to tell your doctor about exposures to molds to aid in the diagnosis of this disease.

Smoking Increases Your Risks

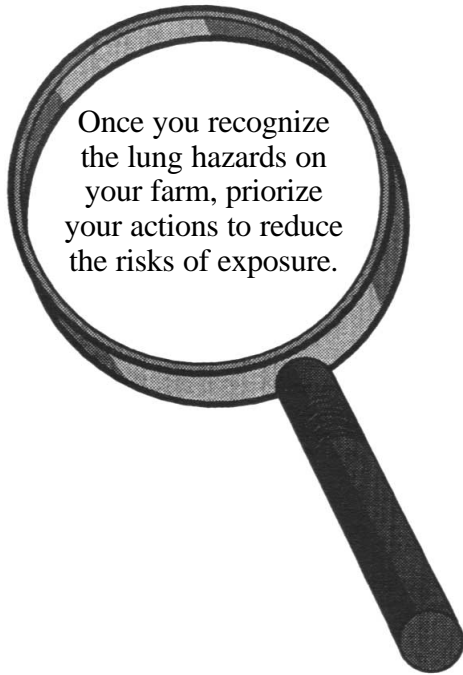
Smoking accounts for a high proportion of deaths due to heart disease, lung cancer and chronic obstructive lung disease (COPD). Cigarette smoking increases the risk of lung infections, pneumonia and bronchitis. Also smokers do not tolerate exercise as well as non-smokers, and they have a slower rate of wound healing. It is linked to low birth weight and an increased risk of death in newborn babies. Children of smokers are at higher



risk of developing asthma, ear infections and of being burned.

Exposure to grain dust has been shown to cause a similar type of lung trouble as that caused by smoking. Therefore agricultural workers who smoke increase their risks of developing lung trouble.

Priorizing Control Measures to Reduce Your Hazards



Use the following “Hierarchy of Control” that ranks hazard control measures in order of effectiveness. Controlling hazards can involve one or more of the following measures:

Elimination

Can the hazard be eliminated? Deciding not to keep hogs or grow a particular crop are examples of eliminating a specific hazard to your health.

Substitution

Substitution is exchanging one product or process for another one to decrease the risk. For example a less toxic pesticide may be used rather than one with a high hazard rating.

Engineering/Design

Sometimes a building or machine can be altered to reduce the hazard. One example is extending spouts on feed shoots to reduce and enclose the dust.

Safe Work Practices

Can you change the way you perform a task to reduce the health hazard? For example, can you weld outdoors?

Personal Protective Equipment

Protective equipment is not a substitute for any of the above controls. Use a dust mask or cartridge-type respirator in combination with other control methods.

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Reference list available upon request.

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