

# Facts About Moulds

## Introduction

This information has been developed by Saskatchewan Health and the Occupational Health and Safety Division of Saskatchewan Labour and is intended to apply to private residences, public buildings and workplaces. Actions indicated in this document may differ between private residences and workplaces. For more information on workplace requirements, contact Saskatchewan Labour - Occupational Health and Safety Division.

## Should I be concerned about mould in my building?

Inhaling large amounts of moulds and their spores can cause health problems. You should be concerned if:

- There is extensive, visible mould contamination.
- Moisture problems have gone untreated. Moulds rapidly multiply when indoor moisture problems are not promptly dealt with. This can result in extensive contamination that may or may not be visible.
- Occupants have been medically diagnosed with building-related illnesses. All other potential building-related causes have been eliminated, and a physician or another health professional suspects mould exposure as a possible cause.

## About moulds

### *What are moulds?*

Moulds are simple, small organisms found virtually everywhere – indoors and outdoors. In nature moulds have an important ecological role. They break down organic material.

Usually, most indoor moulds come from the outdoors. It is common to find moulds and their spores in the air of buildings and growing on certain moistened structural materials, furnishings and other building contents. Mould growth can often be seen as coloured, woolly or sooty-textured growth. Common colours include white, orange, green, brown and black. Moulds may give off a musty or earthy odour or smell faintly like alcohol.

As moulds grow they produce a variety of chemicals. Some of these chemicals, like antibiotics, have a beneficial effect in people. Some moulds, referred to as “toxic” moulds, produce chemicals that can have toxic effects at sufficient doses. These chemicals, which are called mycotoxins, may be present in live or dead moulds or mould spores.

***What do moulds need to grow?***

- A food source, such as leaves, wood, paper or dirt
- A source of moisture
- A place to grow (mostly in darker areas)

Indoor food sources include cellulose and other carbohydrates contained in structural materials, such as ceiling tiles, gyproc, ventilation insulation, wallpaper, wood, fabric and dust. These materials also provide a place for moulds to grow.

The following are some sources of indoor moisture:

- |                                     |                                                          |                                                                  |
|-------------------------------------|----------------------------------------------------------|------------------------------------------------------------------|
| ➤ Flooding                          | ➤ Backed up sewers                                       | ➤ Leaky roofs                                                    |
| ➤ Condensation on walls and windows | ➤ Cool air humidifiers                                   | ➤ Mud or ice dams                                                |
| ➤ Damp basement or crawl spaces     | ➤ Constant plumbing leaks                                | ➤ House plants (watering can generate large amounts of moisture) |
| ➤ Saunas                            | ➤ Steam from cooking                                     | ➤ Wet clothes on indoor drying lines                             |
| ➤ Clothes dryers vented inside      | ➤ Shower/bath steam or leaks                             | ➤ Water damage to insulated air-ducting systems                  |
| ➤ Moisture build-up in wall spaces  | ➤ Combustion appliances (e.g. stoves) not vented outside |                                                                  |

**Health problems associated with indoor moulds**

***How are people exposed?***

Mould fragments and spores are very tiny and lightweight. This allows them to travel through the air. People regularly inhale some amount of moulds and mould spores. People may also have some skin contact when they handle, touch or disturb mouldy materials.

***Do These Moulds Affect a Person's Health?***

- People are exposed to some amount of moulds and their mycotoxins on a daily basis, usually without harm.
- Exposure to substantial amounts of mould and mould spores, along with other substances in indoor air may contribute to skin, eye and respiratory irritations. This is the most common effect of indoor mould exposure.

- Mould fragments and mould spores may cause or worsen the symptoms of asthma and other respiratory sensitivities, usually in susceptible individuals.
- Exposure to very large amounts of moulds may contribute to a rare, short term, flu-like illness that is reversible.
- There is a concern that exposure to mould fragments or spores containing sufficient amounts of mycotoxins may cause more severe effects than exposure to moulds that do not contain mycotoxins.
- Significant effects on the immune, nervous, circulatory, reproductive and gastrointestinal systems have been reported in animals and humans who have eaten food heavily contaminated with moulds and mycotoxins. These effects have been reported in a few rare cases where persons disturbed and inhaled large amounts of mycotoxin-contaminated materials while working in agriculture. The effects were attributed to mycotoxins that were present in the materials. Similar high-level exposures are unusual in indoor settings unless large areas of mould materials are disturbed (for example, during building renovations or during mould cleanups (remediation) of severely contaminated buildings).
- An association has been suggested between mycotoxin exposure and cases of pulmonary hemorrhage/hemosiderosis in infants. This association has since been reviewed and questioned. To date it is unproven.
- Some mycotoxins have been reviewed for their ability to cause cancer, including a small number of mycotoxins associated with indoor moulds. Several of these indoor mould mycotoxins were considered possible human carcinogens. They were not shown to cause cancer in people but they did produce cancer in experiments when animals were fed large amounts of these mycotoxins or were exposed by skin application.
- A small number of moulds have caused sinus and respiratory infections, but this is unlikely to occur in persons with healthy immune systems.

To date there are few, if any medical tests to differentiate mould or mycotoxin-related health effects from other unrelated causes.

***Who is at greater risk when exposed to mould?***

Certain individuals may be more likely to experience adverse health effects from mould exposure:

- |                        |                                                                                                     |                                                                                                                    |
|------------------------|-----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|
| ➤ Infants and Children | ➤ Immune Compromised Patients (people with HIV, infection, cancer chemotherapy, lung disease, etc.) | ➤ Individuals with existing respiratory conditions, such as asthma, environmental or other types of sensitivities. |
| ➤ Pregnant Women       |                                                                                                     |                                                                                                                    |
| ➤ Elderly              |                                                                                                     |                                                                                                                    |

***What symptoms are reported by persons exposed to moulds?***

The most common and well-established symptoms of indoor mould exposure are:

- runny nose
- eye irritation
- cough
- congestion
- aggravation of asthma and other respiratory symptoms
- headache and fatigue

There have been reports of other symptoms in buildings where substantial amounts of moulds were present. Reported symptoms have included (alone or in combination): weakened resistance to infections, skin irritation and rashes, memory problems, mood changes, aches and pains and possible fever.

**Preventing mould problems**

- Keep the humidity in the building below 40%
- Regularly clean and disinfect humidifiers and air conditioners
- Be sure the building has adequate ventilation, including exhaust fans in kitchens and bathrooms
- Repair leaky roofs, walls and basements
- Continually monitor and deal with moisture problems. Signs may include condensation on windows, swelling or cracking of plasterboard, drywall tape loosening, wood warping and musty odours.
- Consider using mould resistant paint for humid rooms such as bathrooms and kitchens
- Avoid carpeting bathrooms and kitchens
- Promptly clean up, disinfect and dry everything after a sewer back-up or flooding
- During renovation work if mould is detected and or disturbed, stop the work and assess the extent of mould contamination. Before continuing the renovations follow the steps listed in the sections of this document on detecting and cleaning up moulds.
- Promptly dry carpets, drywall, wood, upholstery, etc. that could become water soaked
- Clean bathrooms with a fungicide
- Discard ceiling tiles that become water soaked
- If the building has a crawl space, make sure that it is kept dry
- In a dirt crawl space ensure that porous structural materials like drywall and cardboard do not contact the dirt floor

Mould should always be kept to a minimum in occupied buildings. Employers have a responsibility to prevent workplaces from becoming extensively contaminated with moulds.

## **Detecting indoor moulds**

### ***How can I tell if I have mould in my house or workplace?***

In a workplace an employer has a duty to monitor worker exposure to substances that may be harmful, including moulds and mycotoxins.

If you can see mould, you can assume you have a mould problem. Look for sources of mould and signs of previous water damage. Mould growth may also be found underneath materials where water has damaged surfaces or behind walls. Look for discoloured plaster.

Where moisture problems or mould contamination are not visible on a wall but are suspected, baseboards should be pulled away from the wall and the base of the wallboard examined for mould growth. When doing so a dust mask (N95) should be worn. An earthy or musty odour may be a sign of a mould problem but odour alone should not trigger an extensive search for moulds behind walls, etc.

Unless the source of moisture is removed and the contaminated area is cleaned and disinfected, mould growth is likely to reoccur.

### ***When should sampling for moulds be considered?***

Sampling may be considered when 1) there is no visible mould, or 2) visible mould has been properly removed and affected areas cleaned and disinfected, but:

- One or more individuals continue to suffer from medically diagnosed, building related illnesses and all other potential building related causes have been eliminated; and
- the attending physician suspects mould exposure as a possible cause.

Sampling for mould can be expensive, and requires equipment not readily available to the general public. Residents of individual private homes must pay a contractor to carry out such sampling, as it is not usually done by public health agencies. Mould cleanup is usually considered one of the housekeeping tasks of the private citizen, along with roof and plumbing repairs, sweeping and house cleaning.

An employer's duty to monitor worker exposure to moulds may include sampling. In some, but not all circumstances, sampling may be the most appropriate way to monitor exposure, for example when extensive mould contamination is suspected, but not visible.

If sampling is being considered ensure that the methods used and the results produced will address the purpose of the sampling. To date we do not know what is a safe or unsafe amount of mould in the air. Contact your local public health inspector or, in the case of workplace buildings, Saskatchewan Labour - Occupational Health and Safety Division for advice on where to locate agencies that provide this service.

The Occupational Health and Safety Division can discuss the need for sampling in workplaces. It is important to check the experience and qualifications of outside agencies doing mould testing and analysis for workplaces.

## **Cleanup**

**Note:** Clean up of small areas (< 10 sq. ft.) of visible mould contamination normally does not require personnel trained in the handling of hazardous materials. If the area or combined areas are greater than 10 sq. ft., or when non-visible moulds need to be remediated (for example in ventilation ductwork), contact your local public health inspector or, in the case of a workplace, Saskatchewan Labour - Occupational Health and Safety Division for advice.

### *What are the general cleanup procedures for small areas?*

**Note:** In workplaces, the employer must ensure that procedures are prepared prior to the cleanup. The procedures must identify measures to protect staff. Protective equipment identified in the procedures must be supplied to workers. The cleanup must be done by properly trained and protected staff (maintenance staff, etc.) If a large area is being cleaned, the employer may contract out this work. In this case, the employer must ensure that the contractor fulfills these duties.

### Preparation

- Identify and correct the moisture source
- Vacate the work area and adjacent areas of susceptible individuals

### Protective Equipment

- N95 disposable respirator
- Gloves
- Eye protection

### Cleaning and Disinfecting Contaminated materials

- Bag and dispose of porous materials with visible mould growth, such as ceiling tiles, wallboard, rags, paper, leaves or debris. Carpets should be discarded if they are extensively contaminated. If the contamination is known to be limited the carpet can be shampooed. Include a carpet disinfectant (e.g. a quaternary ammonium compound) in the carpet shampoo.
- Thoroughly clean less porous surfaces (such as glass, plastic, concrete or metal) using a strong detergent followed by lots of water. Following this, disinfect the surfaces with a disinfectant (for example a 1 in 10 dilution of household bleach in water). The contact time with the surface area should be a minimum of 10 minutes.

### *Can cleaning up mould be hazardous to my health?*

Yes. Disturbing and removing mould-contaminated materials can release massive amounts of mould materials into the air. Wearing a dust mask is critical. It is also essential that steps are taken to prevent the spread of mould to adjacent areas.

***Can air duct systems become contaminated with mould?***

Yes. Air duct systems can be contaminated with mould. This type of contamination may have been identified by sampling. Duct systems can be constructed of bare sheet metal, sheet metal with exterior fibrous glass insulation, sheet metal with an internal fibrous glass liner, or made entirely of fibrous glass. If your building's air duct system has had water damage, first identify the type of air duct construction that you have. Bare sheet metal systems or sheet metal with exterior fibrous glass insulation, can be cleaned and disinfected.

If your system has sheet metal with internal fibrous glass liner, or is made entirely of fibrous glass, the ductwork may need to be removed and discarded. Ductwork in inaccessible locations may have to be abandoned. Contact an air duct cleaning professional or contractor for assistance.

***After I've cleaned everything as thoroughly as possible, can I still have mould odours and problems?***

Yes. It is possible that the problems and odours may persist. Continue to dry out the area and search for mould. If the area continues to smell musty, you may have to re-clean the area (follow the cleaning steps given in this sheet). Continue to dry and ventilate the area. Don't replace flooring or begin rebuilding until the area has dried completely.

In some cases, if problems persist, a more extensive assessment may be needed.

**Useful publications**

- New York City Department of Health: Guidelines on Assessment and Remediation of Fungi in Indoor Environments
- About Your House – Fighting Mould, CMHC CE8

**For further help or information**

- In the case of workplace environments contact Saskatchewan Labour - Occupational Health and Safety Division at 1-800-567-7233.
- In the case of private residences or public places, contact your local public health inspector.

