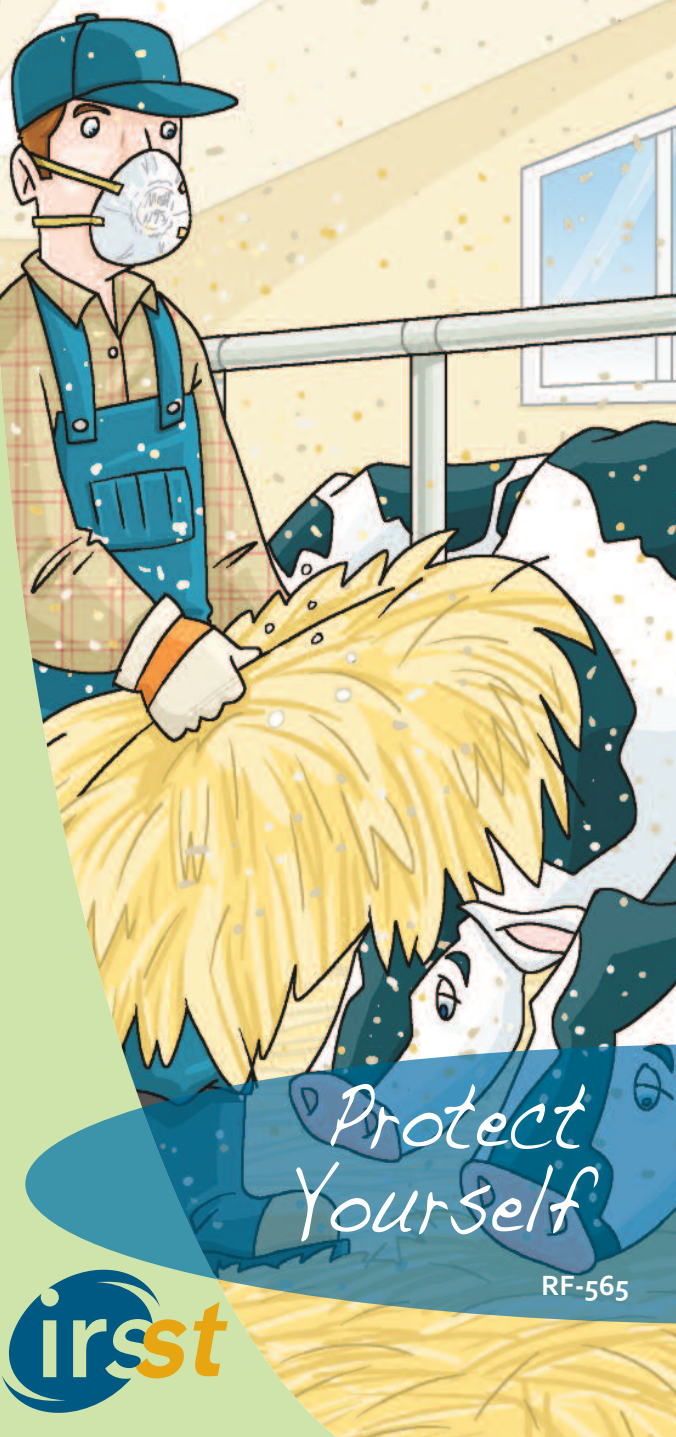
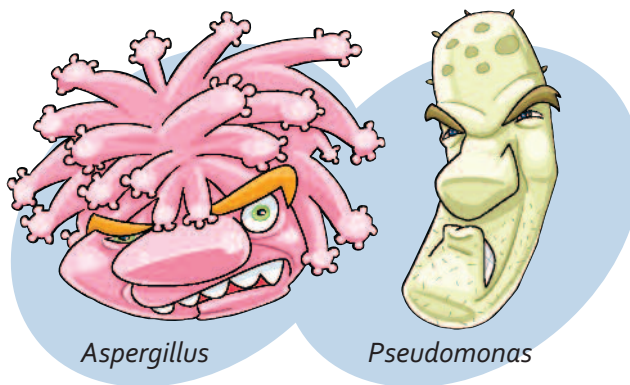


# AGRICULTURAL BIOAEROSOLS



## Risk

Bioaerosols are airborne particles consisting of micro-organisms such as bacteria and molds.



These micro-organisms are generated by animals and the rotting or decomposition of organic matter.

The larger the population in the air, the greater is the risk of respiratory problems (allergies, breathing difficulties, asthma).

## Varying levels of concentration

The level of bioaerosols in agricultural buildings varies with the season, the amount of ventilation and the type of activities performed in the building.

In the summer, levels are lower because buildings are better ventilated, and they are especially low at night when animals are resting.

In the winter, levels are higher because buildings are typically less ventilated.

Regardless of the season, levels increase with human and animal activity, and are especially high during cleaning or animal feeding time.

Examples of micro-organisms concentration recorded under unfavourable conditions:

<u>Building</u>	<u>Concentration</u> <sup>1</sup>
Mushroom farm (compost)	1 million
Pig barn	1 million
Hen house	10 million
Cattle shed	10 million
Litter barn	1 billion

<sup>1</sup> Concentration of bacteria per cubic meter of air, expressed as a colony-forming unit (CFU).

## Prevention

The first preventive measure is to improve ventilation in the buildings. This will reduce the ambient levels of bioaerosols. The second is to wear a respirator.

Wearing a respirator is strongly recommended for any activity that generates airborne particles, especially when the safety limit of 10,000 micro-organisms per cubic meter is exceeded.

## Protection factor

Wearing a respirator does not guarantee complete protection. Different types of respirators carry different assigned protection factors (APF). In order to find out the level of bioaerosols to which you are exposed while wearing a respirator, simply divide the ambient level by the APF of your respirator.

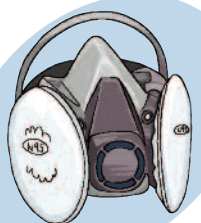
For example, if you are wearing a respirator that has an APF of 10 in a pig barn where the ambient level is one million, you are exposed to 100,000 bacteria per cubic meter of air (one million divided by 10 = 100,000).

# Respiratory protective equipment

Different types of respiratory protective devices are commercially available. One model for each type is illustrated below, with the corresponding APF.



Certified mask<sup>2</sup>  
APF = 10



Polymer half-facepiece respirator  
APF = 10



Powered air-purifying respirator with loose fitting facepiece  
APF = 25



Polymer full-facepiece respirator  
APF = 100

<sup>2</sup> Beware of common dust or surgical masks that do not offer appropriate protection. Certified masks and filters display the emblem of the *National Institute for Occupational Safety and Health* (NIOSH) and an efficiency number of at least N95.

## Using a respirator

For adequate protection, the respirator must fit tightly around your face.

Choose one among many types that fits the shape of your face.

Check the fit each time you use it by doing a simple inhale/exhale test to make sure the respirator does not leak.

- 1) Cover the filter area with your hands and inhale. The respirator should deflate slightly.
- 2) With your hands still on the filter area, exhale. The respirator should bulge slightly. If there are leaks, readjust the respirator.



## Lifespan of a respirator

Disposable masks are designed for single use only and should be discarded at the end of the day.

Polymer respirators should be cleaned after each use and the filters discarded at the end of the day.

## Caution

Masks and filters do not protect against:

- Gases and chemical fumes
- Oxygen deprived environments (manure pits, silos and any enclosed spaces)

The advice contained in this brochure applies to agricultural bioaerosols made up of non-infectious micro-organisms.

In the presence of infectious micro-organisms such as the avian flu virus, extra protective measures must be taken.

For more information, visit [www.irsst.qc.ca](http://www.irsst.qc.ca) and download the following documents at no charge:

- Information sheet on work-related asthma RF-531
- Guide on respiratory protection against bioaerosols RG-501
- Guide on respiratory protection R-319 (in French only)
- RF-565 for a copy of this brochure.

See also the following guides on avian influenza:

- DC200-701 at [www.csst.qc.ca](http://www.csst.qc.ca) (in French only)
- 2008-113 at [www.cdc.gov/niosh](http://www.cdc.gov/niosh)

Writing: Louis Bousquet, IRSST  
Jacques Lavoie, IRSST  
Johanne Asselin, CCHSA

Graphics: BIZBIZ créations  
Production: Service valorisation et relations avec les partenaires, IRSST

Institut de recherche Robert-Sauvé  
en santé et en sécurité du travail  
505 De Maisonneuve Blvd. West  
Montréal (Québec) H3A 3C2  
Telephone: 514 288-1551

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