

## Wildfire Smoke and Horses

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The severe fires in southern California exposed humans and animals to unhealthy air containing wildfire smoke and particulates. These particulates can build up in the respiratory system, causing a number of health problems including burning eyes, runny noses and illnesses such as bronchitis. They can also aggravate heart and lung diseases such as congestive heart failure, chronic obstructive pulmonary disease, emphysema and asthma.



Because little information is available to horse owners and even equine veterinarians on the effects on horses of breathing air laden with particulates, some suggestions are offered here to serve as a general guide.

### **What's In Smoke?**

Smoke is made up of carbon dioxide, carbon monoxide, particulate matter, soot, hydrocarbons and other organic substances including nitrogen oxides and trace minerals. The composition of smoke depends on what is burned; different types of wood, vegetation, plastics, house materials, and other combustibles all produce different compounds when burned. Carbon monoxide, a colorless, odorless

gas that is produced in the greatest quantity during the smoldering stages of the fire, can be fatal in high doses.

In general, particulate matter is the major pollutant of concern in wildfire smoke. Particulate is a general term used for a mixture of solid particles and liquid droplets found in the air. Particulates from smoke tend to be very small (less than one micron in diameter), which allows them to reach the deepest airways within the lung. Consequently, particulates in smoke are more of a health concern than the coarser particles that typically make up road dust.

### **How Smoke Affects Horses**

The effects of smoke on horses are similar to effects on humans: irritation of the eyes and respiratory tract, aggravation of conditions like heaves (recurrent airway obstruction), and reduced lung function. High concentrations of particulates can cause persistent cough, increased nasal discharge, wheezing and increased physical effort in breathing. Particulates can also alter the immune system and reduce the ability of the lungs to remove foreign materials, such as pollen and bacteria, to which horses are normally exposed.

### **Protecting Horses from Air Pollution**

- Limit exercise when smoke is visible. Don't have your horse do activities that increase the airflow in and out of the lungs. This can trigger bronchoconstriction (narrowing of the small airways in the lungs).
- Provide plenty of fresh water close to where your horse eats. Horses drink most of their water within 2 hours of eating hay, so having water close to the feeder increases water consumption. Water keeps the airways moist and facilitates clearance of inhaled particulate matter. This means the windpipe (trachea), large airways (bronchi), and small airways (bronchioles) can move the particulate material breathed in with the smoke. Dry airways make particulate matter stay in the lung and air passages.
- Limit dust exposure by feeding dust-free hay or soak hay before feeding. This reduces the particles in the dust such as mold, fungi, pollens and bacteria that may have difficulty being cleared from the lungs.
- If your horse is coughing or having difficulty breathing, have your horse examined by a veterinarian. A veterinarian can help determine the difference between a reactive airway from smoke and dust versus a bacterial infection and bronchitis or pneumonia. If your horse has a history of having heaves or recurrent airway problems, there is a greater risk of secondary problems such as bacterial pneumonia.
- Give your horse ample time to recover from smoke-induced airway insult. Airway damage resulting from wildfire smoke takes 4 to 6 weeks to heal. Therefore, plan on giving your horse 4 to 6 weeks off from the time when the air quality returns to normal. Attempting exercise may aggravate the condition, delay the healing process, and compromise your horse's performance for many weeks or months.

- If your horse has primary or secondary problems with smoke-induced respiratory injury, you should contact your veterinarian. He/She can prescribe specific treatments such as intravenous fluids, bronchodilator drugs, nebulization, or other measures to facilitate hydration of the airway passages. Your veterinarian may also recommend blood tests or other tests to determine whether a secondary bacterial infection has arisen and is contributing to the current respiratory problem.