

# HEALTH ZONE

## Respiratory Health

BY HEATHER SMITH THOMAS



COURTESY HEATHER SMITH THOMAS

Horse receiving breathing treatment through a nebulizer

**IF A HORSE CAN'T BREATHE OPTIMALLY**, he can't run as fast or as far. Respiratory health is important for any racehorse, so preventing and minimizing respiratory disease are crucial. This means keeping the horse's environment as dust- and allergen-free as possible while also trying to prevent contagious diseases that can affect the respiratory system.

Dr. Amy Johnson, (Large Animal Internal Medicine, New Bolton Center in Pa.) says there are several types of respiratory disease. Infectious diseases include viral pneumonia and bacterial pneumonia (infection in the lungs). Non-infectious respiratory disease includes inflammatory airway problems such as heaves. We also differentiate between upper respiratory versus lower airway disease (lungs).

### VIRAL DISEASES

Some of the most common infectious respiratory diseases are influenza and rhinopneumonitis.

"Vaccination is important in prevention," Johnson said. "We have good vaccines for influenza and for EHV-1 and EHV-4.

## Prevention and minimizing respiratory disease are crucial to a horse's overall health

All horses should be up to date on these vaccinations, especially if they come into contact with other horses.

"There are other viruses for which we don't have very good vaccines. Prevention for those entails minimizing exposure to other horses, which can be difficult when horses are at the track. It helps, however, if horses don't have nose-to-nose contact with strange horses and never share water sources.

"In general, respiratory viruses are spread via nasal secretions and transmitted by sneezing, coughing, and direct contact—or contact with objects recently touched by an infected horse," she explained.

Sometimes human handlers inadvertently serve as the fomite (transmitting object) if a horse coughs on or rubs his nose on a person who then touches another horse.

### BACTERIAL DISEASES

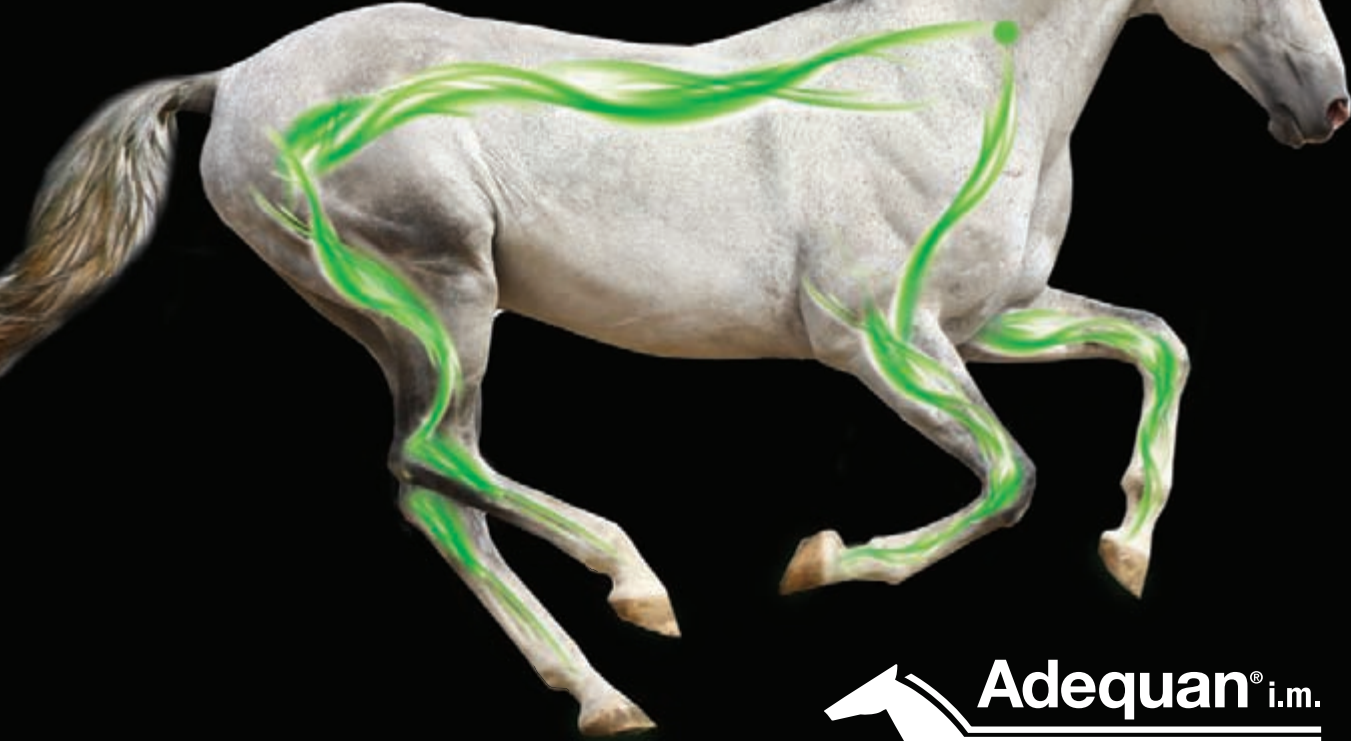
Some bacterial infections end up in the lungs and cause a pneumonia that is often termed "shipping fever" as it is common in animals that undergo the stress of a long haul. Strangles, however, is a bacterial infection that causes upper respiratory disease.

"Whether to vaccinate for strangles is controversial because the vaccine itself can create problems," Johnson said. "The occasional side effects of the vaccination can be serious. In rare instances we've seen vaccine-induced cases of strangles where the horse gets a strangles-type syndrome, but it's actually the vaccine organism rather than the natural pathogen.

"The other concern with strangles vaccine is immune-mediated diseases, the worst being purpura hemorrhagica. This usually occurs in horses that already have a high antibody titer against strangles, and the vaccine acts as a second exposure that triggers the reaction. The best situation, if a horse has been well vaccinated for strangles or has already had the disease, is to check titer level before re-vaccinating.

"This entails a blood test to see how high the antibody level is," she said.

This vaccine for that particular horse should be discussed with a veterinarian, to know whether it should be vaccinated.



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ERICA LARSON

Vaccinating for strangles is controversial because the vaccine itself can create problems

while traveling. If a horse must be fed during the trip, it's often best to feed pelleted hay (less dusty) or soak the hay (fed in a hay net) so it won't be dusty.

Hauling can be stressful, and stress alone can compromise the immune system and make a horse more susceptible to respiratory disease.

"When feasible, it helps to give horses a break after a few hours of traveling and take them out of the trailer," she said. "If you can let them graze a little, this not only helps relax them but also gets their head down, to get rid of build-up of respiratory secretions and foreign particles. This might not be possible, however, depending on the trip and where they are going."

## MONITOR

Keep close track of horses' health, especially after they have been somewhere else—to a race, training facility, or another track.

"It's important to detect diseases early—to prevent spread to other horses and to initiate treatment if necessary," Johnson said. "The earlier you can treat disease, the better response and quicker recovery.

"Take temperatures twice a day," she continued. "It's important to know what the horse's normal temperature is (since

## BIOSECURITY

"On a farm it helps to keep the traveling horses apart from the rest of the home population for two weeks after they return, to make sure they are not incubating a virus that might appear five to seven days later," Johnson said.

The horse might seem fine upon arrival, then start showing signs of respiratory disease a week later. Unless he has been kept separate, he might have infected the at-home horses he came into contact with.

The traveling horse should be kept in another barn or pen, if possible, or at least in a stall at the other end of the barn, or in a pen where he doesn't have nose-to-nose contact over the fence with other horses for a while. It's difficult to maintain biosecurity at a racetrack, however.

## SHIPPING HORSES

"When hauling, the aspect of traveling that seems to predispose horses to 'shipping fever' or bacterial pneumonias is having their head tied up to where they can't lower the head to clear the secretions and inhaled particles out of the airways," Johnson said. "To cough effectively and get rid of these, a horse must

be able to put his head down.

"Researchers have replicated shipping fever simply by tying horses' heads up in their stalls. It doesn't require a trailer or traveling. If the head is tied up for a certain period of time, the horse can get pneumonia just from not being able to lower the head and clear out the mucous secretions," she explained.

There is often dust in a trailer or horse van, especially if the horse is fed hay



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Transporting horses adds stress, which can cause respiratory issues

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Flared nostrils can be a sign of heaves

some individuals' resting normal temperature is about 99 degrees, compared to another individual that might have a normal temperature of 100.5), and then be able to detect any rise in temperature. If temperature is a couple of degrees above his normal, consult with a veterinarian.

#### PREVENTION

Horses that are minimally stressed and well hydrated, with access to adequate nutrition, are less likely to get sick than a horse that is dehydrated or malnourished or severely stressed.

"Whatever you can do to keep your horses as healthy as possible will be a

"At the track, if possible have the horse in the best-ventilated section of the barn and use dust-free bedding such as shavings."

— Dr. Amy Johnson

"If it seems to be a viral infection, it might not need treatment except supportive care and non-steroidal anti-inflammatory medication to make the horse feel better and keep eating and drinking. A bacterial infection, however, could be the beginning of a pleuropneumonia or 'shipping fever,' and if treatment with antibiotics is started early, one could hopefully keep it from developing into a severe pneumonia. By contrast, if it slips under the radar for a period of time before treatment is begun, the pneumonia may be worse, and harder to treat."

great help," Johnson said. "Hydration is one of the most important things for horses that are traveling because most of them have adequate nutrition.

If weather is hot, dehydration on a long trip can be a factor in risk for respiratory disease.

"The mucous secretions become thicker so they are not cleared from the airways as easily," she said. "This also predisposes the horse to infections."

#### HEAVES

Some horses are prone to non-infectious respiratory disease that closes

off the airways and impairs breathing. These conditions are most common in horses that are sensitive to dusty hay or straw—particularly airborne particles such as endotoxin (part of the cell wall of gram-negative bacteria that frequently exist in hay and straw) in the dust. Symptoms are similar to those of a person with asthma.

"Horses that are prone to these inflammatory airway diseases (recurrent airway obstruction, or heaves) need careful management to minimize the amount of dust inhaled. This is probably accomplished most easily by soaking their hay. Many of these horses have to be on soaked hay, or no hay—fed chopped forage products or a total pelleted ration. This can be especially important when feeding in a trailer or van, where dust from the feed might be blowing around and readily inhaled, according to Johnson.

"At the track, if possible have the horse in the best-ventilated section of the barn and use dust-free bedding such as shavings," she said. "Even if that stall is bedded in shavings, if the stalls next to it are bedded with straw, there's not much you can do to keep the horse from breathing dust."

Dr. Virginia Buechner-Maxwell, professor of Large Animal Internal Medicine, Virginia-Maryland College of Veterinary Medicine (Blacksburg, Va.) says equine heaves is usually seen in middle-aged or older horses.

"Horses with heaves experience airway inflammation and bronchoconstriction due to an allergy-like reaction to some factor in the environment," Buechner-Maxwell said. "In this way, heaves is similar to human asthma, which is a disease caused by an allergy to certain antigens or irritants in a person's environment.

"Most commonly, heavy horses react to factors in the barn environment," she said. "Some common causes of heaves include exposure to hay that contains the common mold *Aspergillus fumigatus*. In other cases pollens seem to initiate the heaves event."

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<sup>1</sup> UC Davis (Nicola Pusterla) & Merck Animal Health. Infectious Upper Respiratory Surveillance Program. Ongoing Research 2008-present.

<sup>2</sup> Townsend HGG. Onset of protection against live-virus equine influenza challenge following vaccination naive horses with a modified-live vaccine. Unpublished data.

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The causative agent is horse-specific. Though there are tests available to assist in defining the allergens that cause reactions, use of tests in horses has not been proved to be consistently beneficial, according to Buechner-Maxwell.

“In most cases, the best way to determine what causes a heaves response is trial and error, and to observe carefully what precedes the onset of an event,” she explained.

“While heaves is not a curable disease, we can learn how to manage the horse in a way as to minimize exposure to the factors that provoke the disease,” she said.

The best way to try to control the problem in a certain horse is to identify the things in that horse’s environment that exacerbate heaves and to avoid them.

“It is also important to learn the early signs associated with exacerbation of the disease and react quickly with a change in environment, along with administration of medication when needed,” she said. “When affected horses are untreated, persistent inflammation in their lungs primes them to be more reactive to other elements that are found in the barn and pasture environment.

“There might be some primary factors that initiate the heaves event and once the lungs become inflamed, they become more sensitive and reactive, allowing secondary elements to exacerbate the

problem; the horse becomes more compromised.”

For example, a horse might be allergic to a particular mold in hay and develop an acute episode of heaves. Once the lungs are inflamed from that trigger, other things exacerbate it.

“Once the lungs become inflamed, they become more sensitive and reactive, allowing secondary elements to exacerbate the problem.”

—Dr. Virginia Buechner-Maxwell

“In all cases the first step is to break the cycle and get a horse into full remission,” she said. “Horses can appear to be normal but still have smoldering airway inflammation. Residual airway inflammation makes the horse more prone to recurring episodes of heaves because the underlying problem (airway inflammation) has not been resolved. Full remission means the horse is clinically normal and the airway inflammation has resolved. This is the goal of

treatment, and maintaining remission is the goal of long-term treatment. If these goals can be attained, many horses with heaves can live long, productive lives and continue an athletic career,” Buechner-Maxwell said.

Regarding medications, the two main categories are corticosteroids (that reduce swelling and inflammation) and bronchodilators.

“When horses are in remission and not showing clinical signs, you can often get away with a much lower dose of corticosteroids to control heaves, as opposed to when they are in crisis and having trouble breathing,” she said. “When they are in crisis, you have to start with higher doses and then wean them down. The goal is to get to the lowest possible dose, and lowest frequency (such as every-other-day treatment), that will still keep the horse comfortable.”

Bronchodilators also help because the inflammation response causes the airways to constrict. “These drugs open the airways but won’t fix the problem,” Buechner-Maxwell explained. “The inflammation is still there; bronchodilators simply relieve symptoms by allowing the horse to breathe more easily. Bronchodilators commonly used are clenbuterol and ipratropium bromide. The latter is similar to atropine, so it could create serious problems if given systemically. Atropine will cause the horse’s gut to shut down, and ipratropium would probably do the same. The way we deliver it is through an inhaler or nebulizer and most of it will concentrate in the lung rather than getting into the gut.

“One of the newer things developed for horses is a nebulizer that is easy to use. There are several available that are handy for putting medication directly into the lungs. If you don’t want to run the risk of using systemic corticosteroids, for instance, this is a good way to manage some of the clinical problems with heaves. It is a lot safer. You can use medications that will then concentrate in the lungs rather than giving them orally and having them go through the whole body.”




COURTESY HEATHER SMITH THOMAS

Nebulizers are easy and safe ways to administer medications

“Sometimes when you get the horse all the way back to normal and eliminate the primary factors that initiated the reaction, then the horse will tolerate other elements in the environment much better,” Buechner-Maxwell said.

But as long as the lungs are still irritated, there might be multiple things that can exacerbate an episode of heaves.

Wetting hay might reduce exposure to aerosolized mold spores. Sprinkling might temporarily settle the dust, but thorough soaking may be necessary to eliminate dust and air-borne particles.

“Soaking hay reduces the nutrient value of the hay,” Buechner-Maxwell said. “A new method for minimizing mold is steaming hay. The nice thing about using a steamer is that you can pick the kind of hay you want for your horses and just steam it for the heavy horse. You don’t have to try to find different hay for that horse. Heat from the steam also kills a lot of microbes. Steaming gets the core temperature up to 212 degrees. This seems to eliminate or greatly reduce the microbes. You are not just wetting the hay but also reducing the load of molds and fungi such as *Aspergillus*.” 

## MINIMIZING RESPIRATORY ISSUES AND BLEEDING EPISODES

Bill Casner, longtime horseman at Flower Mound Texas, has owned and trained racehorses for many years, starting as a young man in 1963. For many years he was co-owner of WinStar Farm near Versailles, Ky. Casner has always tried to be proactive in providing his horses optimum opportunity to grow up sound and strong and to be able to compete at their best ability through a racing career.

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Bill Casner propounds clean stalls to combat pathogens that impair breathing

“We have reduced our bleeding to less than 5%, probably closer to 3%,” Casner said. “It is rare now for us to have a horse bleed during a race. We do this by managing the horses without bute (which acts as a blood thinner, which can make horses more prone to bleeding) and without Lasix (Salix). We also try to manage the respiratory environment these horses live in.

“Inflammatory airway disease is another reason some horses bleed,” he continued. “Guttural pouch problems, inflamed throats—any number of things can impair breathing. In a stall, horses live in filthy environments. The barn is dusty and most stalls have had horses in them for decades. They are full of microbes and pathogens.

“In our barns we reduce pathogens, spraying the stalls with an antimicrobial called Ceragyn Stall Disinfectant. This product was created at the University of Utah and is a phenomenal antimicrobial that is nontoxic. We fog stalls with this at the racetrack and in the barn at my ranch here in Texas. This has helped reduce our horses’ respiratory problems dramatically.

“We power wash stalls at the racetrack, disinfecting them with Clorox before we put horses into them, and clean them as thoroughly as possible—removing all the dirt and dust,” he said. “After the horses are in the stalls, we fog the stalls twice a week. With this product you can even fog the hay and grain (the feed doesn’t have to be removed first); you don’t have to worry about any negative effects. There’s 25 years’ study on this product, and there is absolutely no toxicity to humans or horses.

“I bring my weanlings from Kentucky to Texas in early December to get them out of the cold Kentucky weather. We have a program here to develop yearlings; we start putting them on a vibration plate in February to strengthen bone and start swimming them in May—to prepare them to become strong athletes—before we start the breaking process.

“The first two years that I brought weanlings to Texas we dealt with coughs and snots and temperatures,” Casner said. “We’d take the horses’ temps every morning. One year every one of the group got sick (coughing, with snotty noses) and we were treating them with a nebulizer. Conventional wisdom rationalizes these things as something that youngsters have to go through to develop immunity. I asked Dr. Rob Holland about this. He’s probably one of the top vets in the country for respiratory issues and also has a PhD in microbiology. He is brilliant when it comes to knowledge about pathogens. I asked him about horses’ having to go through all this to develop immunity.

“Dr. Holland laughed and told me there are billions of different microbes that can cause inflammatory airway disease,” Casner explained. “When a horse develops immunity, it’s only to that one pathogen the horse encountered. There are millions of others—fungi, bacteria, and viruses—that can cause problems. Dr. Holland told me that horses naturally develop immunity as they get older; it’s part of maturing as their immune systems become stronger and more able to deal with any type of pathogen encountered. It’s like people.

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Kids are always sick but as they get older they develop immunity to common illnesses.

“I thought that was interesting, and we found that after we started fogging the stalls, it made a huge difference; we’ve had NO horses with coughs and snots. I still can’t believe how well this works. Before we started fogging stalls, my first question when I’d come into the barn was ‘what are the temps?’ The barn crew posts all the temps on the board, and I’d look to see which ones had a fever, which ones were coughing or snorting. You’d walk through the barn and hear a cough and immediately try to see which horse it is. We still take temps every morning, but we haven’t had a temp, cough, or snots in the past several years.

“You have to manage the barn environment because stalls are terrible places for horses,” Casner reiterated. “The roof keeps in all the dust and ammonia, which is irritating to the lungs. In the horse business people do things because this is the way it’s always been done. They don’t question traditional practices, which include keeping horses in stalls.”

Horses evolved outside, in clean air.

“We try to minimize stall time and give our horses as much turnout time as we can,” he said. “This is not as easy at the racetrack, and that’s why it’s so important to manage the stall environment.”

Many people at the track use hay nets in stalls, and horses have to reach up to eat. Dust from the hay falls into their nostrils, and the heads-up position is unhealthy. The tiny hair-like cilia that line the air passages are designed to keep moving in wavelike motions to continually push debris out of the windpipe—toward the nose and throat where it can be coughed out or swallowed rather than going on down into the lungs. Horses need to have their heads down while eating; this is the natural grazing position and the healthiest for the respiratory system.

“But people like the hay nets,” Casner said. “Horses bury their noses in them and have to inhale all that dust. We



COURTESY HEATHER SMITH THOMAS

Horses in transport have to reach up to eat from hay nets, which allows dust to fall in their nostrils

prefer to have the hay on the ground, on a clean mat. We also cook it with a steamer, which not only eliminates any dust but also kills the microbes, including mold spores. It makes the hay more palatable and digestible while making it healthier for the horse.

“If a person can manage the respiratory environment in the barn, horses will be healthier,” he said. “Fogging stalls is easy (it only takes about four minutes to disinfect a stall) and inexpensive. If a

horse does develop a respiratory issue or scopes with a bit of blood or mucus after a race, we use a nebulizer and a colloidal silver product that is an antimicrobial and works very well.”

Respiratory health is a big issue for equine athletes. Anything a person can do to prevent respiratory illness will pay off. **BH**

*Heather Smith Thomas is a freelance writer based in Idaho.*

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