

Breathe easy

With more and more horses showing signs of respiratory disease, our stable management routines are crucial. Vet **Linda Belton MRCVS** explains how you can protect your horse

As in human medicine, the equine population is showing an ever-increasing incidence of respiratory disease. Similar theories abound in each area about possible causes, but in the horse world there can be no doubt that our horse management systems are a major contributory factor in respiratory ill health.

The horse can only breathe via its nostrils. From here, the air is taken through the larynx, down the windpipe and into the smaller airways, from where oxygen is absorbed into the lungs. Therefore, anything inhaled with the air can also potentially reach the lungs.

However, there are defence mechanisms. Large, inhaled particles are filtered out in the nose itself, while the millions of 'cilia' that line the airways trap smaller particles and clear them from the respiratory tract.

Cilia are microscopic strands attached to the goblet cells that line the airways and produce mucus. The mucus and the cilia combine to form an 'escalator', which carries trapped particles back up the airway away from the lungs. Mucus can be coughed up and harmlessly swallowed, or can appear as a nasal discharge. Damage to this mucociliary escalator, or overwhelming challenge in terms of number of inhaled particles, can result in these reaching the lungs, resulting in poor respiratory health.

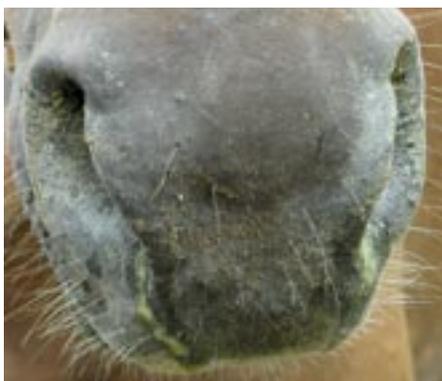
Recurrent airway obstruction

When at rest, the average horse breathes more than 70,000 litres of air per day. In typical stable conditions, with each breath your horse inhales approximately 12 million particles, including dust, moulds, allergens and irritants. If stables are poorly ventilated or the bedding or hay are of a poor quality, then the situation is even worse.

Fungal spores and pollen dust are the most significant in terms of triggering an allergic reaction in the lungs. The allergic reaction in the airways results in the production of fluid, as well as thickening and spasm of the airway walls, leading to a reduced airway diameter, so the horse has to make an increased effort to breathe. This condition is now known as recurrent airway obstruction, or RAO. It has had many other names, such as chronic obstructive pulmonary disease (COPD) or 'heaves'.

Affected horses will develop a cough to clear trapped mucus and often have a white nasal discharge at both nostrils. In early cases, the only evidence may be poor exercise tolerance and a slight nasal discharge or dry cough, which often go unnoticed but, if left untreated, the horse may start to find faster work more difficult.

As the disease progresses, an affected horse will cough with only slight exercise and in severe cases, will have difficulty breathing even at rest. Other than in very severe or long-standing cases, the changes



Mucus can appear as a nasal discharge.

occurring in the lungs are usually reversible, though not cured, as affected horses will usually react to dust throughout their lives. With medication and management changes, the progress of the disease can be halted and the horse helped to accommodate it.

Managing the condition

As RAO is an allergic problem, the triggering allergen, usually spores or pollens associated with stabling or with seasonal flowering of certain plants, should be avoided. Pollens are really unavoidable, but the levels in the air fluctuate greatly depending on the season, location and weather conditions.

Spores are present in hay and straw, mouldy feed and other organic material. Many early-stage cases of RAO respond well to changes in management that remove the source of the allergen.

Good stable ventilation is crucial and often overlooked. I see people far more worried about horses being cold than having adequate fresh air. Although draughts at horse height need to be avoided, it is otherwise impossible to overdo fresh air! Indoor stabling can be a problem with regard to ventilation,

especially if there are a large number of horses in the one airspace. American barn-style stabling rarely needs the end doors closing, yet how many yards achieve this? Some relatively small changes to the design of your horse's stable can reap large rewards:

- Bedding should be kept scrupulously clean and deep litter avoided.
- Bedding should also be dust-free – such as cardboard or paper shreds.
- Hay should be of good quality and thoroughly soaked for about 30 minutes before being fed to ensure that all the spores are wet and ideally remain wet for the time it takes the horse to eat the hay ration. Wet spores will not become airborne and thus cannot be inhaled.
- Hay should be fed from the floor. This mimics the horse's natural grazing position and aids the function of the mucociliary escalator in clearing mucus.

As well as paying attention to your own horse's stable, you need to do what you can about the environment in any adjoining stables that share the same airspace with your horse. This is easy if you are in your own yard, as you can manage all your horses in the same way, but in shared or DIY yards it can be more problematic. If the next-door horse is bedded on straw, the dust cloud will affect your horse's stable, too.

Take precautions when mucking out and grooming – have your horse outside. The dust created during even a brief grooming can trigger an allergic reaction in a susceptible horse that can take a long time to resolve.

Keeping exposure to dust and spores to a minimum makes a massive difference



Use dust-free bedding, such as paper or cardboard.

to a horse's respiratory health and thus to his performance and welfare.

Horses kept outside generally suffer far fewer respiratory problems than stabled horses. With the advent of modern turnout rugs, it is eminently possible to keep a horse that is in work, turned out all year round. Suitable ground conditions must be maintained, however – standing knee-deep in mud is obviously not desirable – and adequate shelter must be provided.



A vet might examine the airways using an endoscope.

Other causes

Not all horses with a cough have RAO, yet telling the difference between a cough's underlying causes can be difficult.

If your horse becomes acutely unwell and has a temperature, this indicates an infectious cause – there are many common viruses that affect the respiratory tract.

The horse can be vaccinated against both equine influenza and the equine herpes virus (EHV). Equine 'flu is a serious viral infection, as is true human 'flu. Horses with equine 'flu are often very ill, with a high temperature and nasal discharge.

'Flu vaccines are required by many competition bodies and this has helped reduce the incidence of this virus, although there are outbreaks every year. It can even occur in vaccinated horses, as the virus is constantly mutating, or changing, and is thus not recognised by the immune system.

Symptoms in vaccinated horses are usually much less severe than in unvaccinated horses, and influenza vaccination remains an important tool in protecting your horse's respiratory health.

Meanwhile, 'flu vaccines are regularly updated to try and protect against the newly identified strains of the virus – even though the virus is usually ahead of the vaccine!

Herpes virus infection can cause a reduction in your horse's performance and a cough. Affected horses can appear otherwise well, although clinical signs do vary. It is possible to vaccinate against the respiratory form of herpes. As with all vaccinations, it is more successful if every horse in the same yard follows the same vaccination routine.

There are other respiratory viruses that show very similar clinical signs, and differentiating between them requires blood tests to identify active infection.

Whether or not it is necessary to pinpoint which virus is the cause depends on the circumstances. For example, if there are a number of other horses at risk, or if changes to vaccination policy may need to be made, then it can be useful.

In individual cases, the identity of the virus may make no difference to the treatment plan. Horses suspected of having any form of infectious cough should be isolated to try and reduce the risk of spread. Unfortunately, horses are often infectious before any signs have been noticed, but this does not mean isolation is not worthwhile.

Coughs also have bacterial causes, such as strangles. Diagnosis depends on clinical examination, and blood tests or swabs may be taken from a coughing horse. Further examination of the airways can be carried

out via an endoscope, a flexible light source that enables the vet to visualise and take samples from the horse's airways. Analysis of these samples provides valuable information as to the underlying cause, suitable treatment and prognosis, and can also be used to monitor the response to treatment and help predict recovery times.

Whatever the underlying cause, any horse with a cough should have a low-dust regime, as the respiratory defence mechanisms will be compromised. It is not uncommon for horses to be left with RAO following a viral respiratory infection. Clean, well ventilated stables, low-dust bedding and the use of haylage or soaked hay are key factors in maintaining your horse's respiratory health.

Expert file

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Treating RAO

Medical treatment of RAO involves the use of both anti-inflammatories, to reduce the mucus production, and bronchodilators, to help open up the horse's airways.

Both can be given in feed but are more commonly now administered by inhalation. This delivers the treatment directly to the target area of the lungs, so less of the



Inhalation delivers treatment directly to the lungs.

medicine is absorbed into the rest of the body, reducing the risk of any side effects.

The anti-inflammatory of choice is a corticosteroid delivered via inhalers with a spacer that fits over the nostril. The success of inhaled therapy depends on your skill and attention to detail in dosing your horse correctly.

The benefits of antioxidants

There has been some good trial work done to show that antioxidants are beneficial in treating RAO. As part of the body's normal, everyday processes, cells produce free radicals. However, if produced in excess, these cause damage and death to cells. Antioxidants – also known as free-radical scavengers – play an important role in maintaining cell health, and thus form part of the body's natural defences.

Levels of antioxidants in the lung-lining fluid of horses with RAO are considerably lower than in unaffected horses. Raising these levels has been shown to improve lung function.

Vitamin C is the most important antioxidant in lung-lining fluid, though simply feeding high levels of it causes an imbalance that can in fact reduce the overall antioxidant capacity.

Vitamin E and selenium are two other well known antioxidants. Horseowners may prefer to purchase a commercial preparation of antioxidants suitable for horses with RAO.