Author - Dr. Robert Tremblay

Dr. Robert Tremblay is a Technical Services veterinarian with Boehringer Ingelheim (Canada) Ltd. He graduated from the Ontario Veterinary College (OVC) in 1982 then practised in New Brunswick. He was a faculty member in the large animal clinic of OVC until 1992. Dr. Tremblay spends much of his time working on the control of infectious diseases of large animals.

Equine Influenza, better known as “Flu”, is a common cause of outbreaks of respiratory disease in horses. According to a recent study in Ontario, Flu is responsible for more than half the outbreaks of respiratory disease in horse barns. Flu occurs in most parts of the world, but until recently, it hasn’t been seen either in Iceland, Australia or New Zealand. In late August, 2007, an outbreak of flu started in the state of New South Wales in Australia that officials have had a difficult time trying to contain.

Equine Influenza viruses:

Equine Influenza is caused by the Equine Influenza Virus (EIV). Like flu viruses in people, equine flu viruses can change their genetic material. This means that there is not just one flu

virus of horses. EIV occurs in 2 general subtypes with each of these subtypes having several names. The first goes by the names subtype H7N7 and A/equine 1. It was first discovered in 1956. The second, found in the early 1960's, goes by the names subtype H3N8 or A/equine 2. This second EIV has also been broken down into smaller subgroups loosely called the Eurasian and North American lineages. The details of the naming of EIV aren't so important. What is important to realize is that flu viruses in horses change over time like flu viruses in humans and animals. These changes mean that flu vaccines should be made with several viruses and that the viruses in the vaccine will likely need to be updated.

Researchers study EIV to find out if the viruses have changed enough to justify a change in vaccines. By monitoring changes in flu viruses, researchers can make recommendations about what revisions might be needed in the viruses in vaccine.

Clinical signs of Equine Influenza:

Equine influenza can affect individual horses and it can also cause outbreaks where many horses develop disease in a short period of time.

Equine influenza has a very short incubation period. If a susceptible horse is exposed to flu virus, it will only be 1 to 3 days before the horse begins to pass the infection on and get sick. This short incubation means that flu can spread among a group of horses very quickly. It can often spread so fast that many horses in a group or in a barn have become infected by the time the first horses are seen to be sick.

The signs or symptoms of influenza can range from very mild to severe. The most common signs of flu are fever (>38.5°C), an increased watery nasal discharge that later may become thick and white (mucopurulent or "snotty nose"). Horses often have a cough that may range from an occasional dry cough to a severe deep, dry hacking cough. Horses will likely be depressed and off-feed. They can show reluctance to move that suggests they have muscle soreness (myalgia). They may also have enlarged lymph nodes. Some horses will develop swelling of their legs and scrotum.

Complications may occur in horses with influenza, especially if they are worked, transported or exposed to dusty conditions while still showing signs of disease such as coughing or nasal discharge. Complications include bronchitis, pneumonia, pleuritis, and, more rarely, damage to

the heart. Foals, particularly those under 5 months, may be severely affected by pneumonia, which can be fatal.

There are other diseases that can cause signs that are similar to flu. There is no way to conclusively diagnose flu based on signs or symptoms, although veterinarians do not usually need to be absolutely sure that they are dealing with flu. If an accurate diagnosis is needed, then blood tests and tests on nasal swabs can be used. The blood tests usual require two samples to be taken a few weeks apart. Nasal swabs must be collected within the first few days after the horse is first seen to be sick.

Spread of Equine Influenza:

EIV can spread in a variety of ways:

• Direct contact with an infected horse. The flu virus is found in the nasal secretions and sputum of infected horses and donkeys. They are infectious for several days before they show signs of sickness and they continue to shed virus while they are sick and for several days afterwards. They can shed flu virus even if they become infected but don't get sick.

• Contact with infected aerosols from infected horses. Flu viruses can be spread over 50 meters in aerosols if the barn or weather conditions are right.

• Contact with tack and other equipment that has been contaminated by an infected horse. These objects that spread the infection are called fomites. Horse trailers and horse handling equipment could also spread flu if they are contaminated by an infected horse.

• Contact with people who have recently been exposed to horses that are shedding flu virus.

Fortunately, the flu virus does not live for very long on people or on fomites. Even if people do become contaminated by coming in contact with an infected horse, they do not remain infected for long.

Equine influenza in Australia

In late August, 2007, a horse near Sydney developed equine influenza. The infection then spread through the states of New South Wales and Victoria (as of November 20, 2007). Until this outbreak, Australia had never had cases of equine influenza so its horses had no natural immunity. Infection spread despite efforts to prevent transmission by regulating the movement of horses and people who work with horses.

By the fourth week of the outbreak, every day, there were 80 to 100 new premises reporting that they had horses with flu. This was in spite of restrictions on horse and human movement. The Australian authorities, who had been somewhat opposed to vaccinating for flu at the start of the outbreak, decided that they would implement a program where horses in specific areas could be vaccinated. The idea was to create 'zones' of vaccinated horses around areas that contained horses with flu. These buffer zones of immune horses would hopefully slow down if not

completely stop the spread of influenza.

This outbreak in Australia gives an idea of how easily flu can spread in a large group of horses when they have no immunity either from natural exposure or from vaccination. The Australian government was able to impose strict quarantine on infected premises and controls on the movement of horses and people working with horses. Even so, they couldn't stop spread of the flu until they decided to increase the immunity of horses by vaccinating a targeted group of horses. The idea was to vaccinate at the edge of the outbreak to create a buffer zone of immune horses to slow down the spread of the disease in addition to slowing the spread by restricting human and horse movement.

Care and treatment for horses with Equine Influenza:

There is no specific anti-viral treatment that will cure horses of influenza. Treatment is intended to make the horse comfortable, to minimize the risk of long-term complications and to reduce the time before the horse can be returned to use. Specific treatment decisions will depend on how sick the horse becomes. Potential supportive treatments include cough suppressants, bronchodilators, mucolytic drugs to help clear the airways and anti-inflammatory drugs not only to reduce inflammation but also to reduce fever. Antibiotics may be used to treatment secondary bacterial infections, especially in horses that have fever for more than four to five days, that have a severe cough or that have copious and thick nasal discharge. High risk horses such as young foals and pregnant mares should be monitored more closely for complications.

Sick horses should be kept on pasture if possible and handled as little as possible to minimize stress. With stabled horses, reduce dust in the feed by changing to a feed like a soft mash or by soaking the hay or feed. Place feed and water buckets on the ground. This helps clear fluids from the airways. Change to new feeds gradually over a few days. Remove and discard any feed that hasn't been eaten. Replace water frequently and disinfect water buckets daily.

Horses suspected of having influenza should be given complete rest. They will usually need at least 30 days complete rest after infection, or longer if they have fever for more than 4 to 5 days. After about 30 days of complete rest, only light exercise is recommended for another 30 days before increasing work to bring the horse back to fitness. Light exercise means walking or alternating trotting for short distances alternating with walking. A good rule of thumb is to aim for a total of 15 to 30 minutes of trotting in total. If your horse tires easily or breathes heavily during or following exercise, reduce the level of exercise.

If the horse had only mild illness with the flu or if it made a quick recovery, you may be able to

start gradually increasing work after a couple of weeks. As note above, complications may occur if a horse with influenza is worked, transported or exposed to dusty conditions while they are still showing signs like coughing or nasal discharge.

Protecting your horses from Equine Influenza:

Equine influenza is a highly contagious disease which can spread rapidly causing outbreaks of respiratory disease. It can affect not only horses but also other members of the horse family like donkeys and mules.

There are two approaches to protecting horses from equine influenza; increasing the immunity of individual horses (increase resistance) and attempting to reduce exposure to sources of influenza viruses (prevent infection). Steps to limit exposure become very important and more difficult in high risk situations (for example, high traffic of multiple horses or horses from multiple sources) and in situations where there is known to be a clear risk (for example, when there is a high risk of contact with horses with respiratory disease).

During the influenza outbreak in Australia, the following recommendations were made to reduce the risk of bringing influenza onto a farm:

• Keep horses as far away as possible from your boundary with other horse properties. Make sure your boundary fences are secure.

• Minimize the amount of contact other people have with your horses. Keep visitors away from the animals, particularly if they may have been in contact with other horses. Keep horses away from fences that border public spaces, where people may be tempted to pat them over the fence.

• Limit your own contact with horses at other places, even if they belong to friends and even if you think the other horses are well. Even if you have not been in contact with other horses, wear clean clothes and wash all exposed skin rigorously with soap and hot water when arriving at and leaving the property where your horses are kept.

• Keep horse equipment isolated to one property. Don’t move saddles, bridles, harness, rugs, feed bins and other horse equipment between properties.

• Monitor your horses as often as you can. For handfed horses, daily monitoring should be sufficient.

• Make sure any feed or bedding is purchased from clean sources and is transported in vehicles that have had no contact with other horses and have been thoroughly decontaminated.

• Avoid driving non-essential vehicles onto premises that hold horses or moving vehicles between properties that hold horses.

• Park your vehicle away from stables, horse paddocks and the main thoroughfare of horses. If visiting another horse property, leave dogs or other pets at home.

Source: Disinfection and on-farm biosecurity. New South Wales Department of Primary Industries, September 28, 2007.

Many horse owners would find that these practices are difficult to implement, but they do provide some guidance on the biosecurity steps that would be necessary to protect horses on your property against introducing influenza.

If you working with horses that have respiratory disease, then you need to be aware that you could carry the virus. There are several steps that you can take to reduce the risk that you will spread infection:

Before coming into contact with horses:

• Wear clean hats and clothes that have been laundered since your last contact with horses and that can easily be laundered afterwards.
• Wear boots that have been disinfected since your last contact with horses.
• If appropriate, wear protective clothing such as overalls, disposable hair coverings and disposable boot coverings.

After contact with infected horses or horses suspected to be infected:

• Scrub any equipment which is leaving the property and has come in contact with horses with soap, detergent or disinfectant.
• At the car or house, blow your nose into a tissue and place the tissue in a plastic bag, leaving it onsite for disposal.
• Remove overalls and hair covering if worn and leave them on-site for washing or disposal.
• Scrub your boots using soap, detergent or disinfectant.
• Clean your glasses or sunglasses.
• Wipe your mobile phone with an alcohol-based cloth such as a baby wipe.
• Launder or disinfect clothing.
• Wash your hands, arms and any exposed skin and hair thoroughly with surgical scrub or soap. Continue washing for at least two minutes. Make sure any exposed skin that may have been contaminated with saliva, nasal secretions or mucus is cleaned thoroughly.
• When you have come into contact with horses, at the end of the day you should have a thorough shower for at least three minutes, including washing your hair, then changing into clean clothes and footwear.

Source: Guidelines for persons visiting a horse property. New South Wales Department of Primary Industries, September 28, 2007

Vaccination:

Increasing resistance to influenza by vaccinating is also a strategy to protect your horse. Flu vaccination has been a controversial subject because there are debates among opinion leaders about the amount of protection that vaccines provide and about the role that variation in naturally occurring equine flu viruses plays in protecting against flu with vaccines. There is not even agreement on what would be the best vaccination program.

The American Association of Equine Practitioners publishes guidelines for vaccination based on the horse's age, sex and use. They recommend vaccinating foals for influenza at 6 months of age with boosters at 7 and 8 months of age. They recommend continuing to boost performance horses every 3 to 4 months. Pregnant mares should be boosted with an inactivated vaccine 4 to 6 weeks before expected foaling to try to optimize the transfer of immunity to the foal through colostrums.

In addition, the AAEP recommends boosting previously vaccinated horses in the face of an outbreak of suspected equine influenza and vaccinating unvaccinated horses with a modified-live intranasal vaccine in the face of a suspected equine influenza outbreak.

The Federation Equestre Internationale (FEI) requires that horses competing with an FEI passport receive an initial influenza vaccination of 2 shots given by the same route (either both in the muscle or both in the nose) between 21 and 92 days apart. A horse must then be boosted every 6 months.

General vaccination recommendations, by their very nature, do not consider that there may be differences in protection provided by different vaccines. Newer vaccines are more commonly shown to provide protection by being tested in challenge studies rather than with blood tests. Challenge studies tend to give a better indication of what protection they may provide against natural disease. They also highlight that there are differences in protection provided by different vaccines.

Other diseases of horses that can look like flu

Other viruses like equine herpes viruses ("Rhino") and equine rhinoviruses can cause respiratory disease in individual horses. Equine rhinovirus also seems able to cause outbreaks of respiratory disease in groups of horses. Equine herpes viruses usually cause respiratory disease in individual horses rather than causing outbreaks. Equine herpes viruses can cause outbreaks of abortion on brood mare farms and outbreaks of neurological disease.

There are also bacteria and mycoplasmas that can cause respiratory disease in horses. Other than strangles that is caused by the bacterium, Streptococcus equi, these diseases usually cause illness only in individual horses. Also, other than strangles, they tend to not be as contagious as viruses that cause respiratory diseases.

Many horses, especially older horses, can develop allergic respiratory disease. Allergic small airway disease should always be considered to be a possible cause in horses with a cough and a nasal discharge.

Equine influenza in dogs

If you have been following the media coverage of cases of severe avian flu, you will know that flu viruses that normally affect one type of animal can become capable of infecting and causing illness in other species, even people. In the case of the severe avian flu, the H5N1 flu virus causes severe disease in birds and can also infect people who have prolonged contact with infected birds. When people became infected with the H5N1 strain of flu virus they became extremely ill and a substantial percentage of ill people died as a result. This is the basis of the fear of a human flu pandemic.

Fortunately, there is no evidence that flu viruses from horses cause any risk to people. Starting in 2004, there were outbreaks of severe flu-like illness in dogs in some kennels in the United States. Researchers at the University of Florida recovered viruses from the dogs. These viruses were actually found to be the H3N8 equine influenza virus by researchers at Cornell University. Through 2005, there were other outbreaks in kennels and at greyhound tracks in at least 10 states causing people to fear that equine flu in dogs would become a major problem. So far that hasn’t happened.