Biosecurity

with Dr Jennifer Stewart

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Would your horse be protected if there was an outbreak?

Biosecurity is the things you do to reduce the risk of transmission of infectious diseases in plants, animals and people. For your property, it means taking steps to protect paddocks from weeds and horse worms, and your horses from diseases – including infectious and non-infectious diseases, toxins, pollutants and even bush fires. This article will focus on infectious diseases.

First, a summary of the features of some of the silent and invisible agents that can cause havoc.

Streptococcus equi
Outbreaks of Streptococcus equi, the cause of strangles, frequently occur in Australia and this little organism has many ways of ensuring its survival: it can survive in mucus and on metal, rubber and painted wood for three days – longer if the weather is partly cloudy. In one laboratory-based study, the bacteria survived for 63 days on wood at 28ºC.

Transmission can occur by horse-to-horse contact, as well as via sharing of contaminated housing, water sources, feed or feeding utensils, twitches, tack, and other less obvious ways such as the clothing and equipment of handlers, caretakers, farriers, and veterinarians.

Flies can also transmit infection and efforts should be made to control the fly population during an outbreak.

S. equi persists in horses for up to 6 weeks after infection and, if it infects the guttural pouch, it can survive for years – causing outwardly healthy horses to carry and shed infectious bacteria. In this situation the source of infection may not be readily recognised and clinical signs may appear unexpectedly in in-contact animals.

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Salmonella
Another bacteria that can exist in a carrier state is Salmonella and healthy horses can carry and shed Salmonella – especially after stresses such as transport. Horses recently discharged from hospital can also shed Salmonella and this has lead to outbreaks. Because it is impossible to predict the degree to which an infected horse sheds Salmonella, a minimum period of 30 days isolation is recommended for diagnosed horses and a period of 14 days after normalisation of manure in horses infected with Rotavirus and Clostridium.

Horse diagnosed with Salmonella should have manure cultures before returning to the normal population and the recovering horse should not be placed in stressful situations or activities as this may induce the recurrence of diarrhoea and/or the shedding of infectious organisms.

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Equine Influenza (EI)
Equine influenza can spread up to 32 metres in the cough of an infected horse, and up to 8km in the wind. It can also spread on skin, fabrics and contaminated equipment. It survives up to 48 hours on plastic and stainless steel, 14 days in tap water and 6 days in horse urine. Influenza viruses are protected in the presence of organic matter and this reduces the effectiveness of disinfectants.

First recorded by a Greek veterinarian in 330 AD, and again in Spain in 1299, the 2007 influenza outbreak in Australia infected 47,000 horses and 5943 properties. There were 2000 people working on eradication and the disease hot line was taking 900 calls a day. Over 136,000 horses were vaccinated and 178,000 tests and 150,000 samples sent for laboratory tests. But it wasn't vaccination that enabled its eradication, it was biosecurity measures. In countries where the vaccination rate is 100%, outbreaks still occur if there are lapses in biosecurity.

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Hendra Virus
Vaccination is however effective in protecting horses from Hendra virus (HeV). Prior to 2011, 14 equine incidents involving seven human cases (four fatal) were recorded. The year 2011 saw a dramatic departure from the sporadic incidents of the previous 16 years, with a cluster of 18 incidents in a single three month period. All human cases can be traced back to infected horses; there has been no flying-fox to human transmission, no evident transmission from flying-foxes to other species, and no human to human transmission.

The damage caused by HeV virus has been reduced by biosecurity measures including early consideration of HeV as a differential diagnosis, the implementation of risk-minimising protocols and appropriate personal protective equipment in the management of suspect cases, timely submission of appropriate samples to laboratories and rapid diagnostic turnaround, and effective quarantine and movement controls on case properties.

Other biosecurity measures include reducing horse-bat contact by restricting horse access to areas under fruit trees, covering water and feed containers to prevent contamination and not placing water and feed under fruit trees.

Control is based on euthanasia and deep burial of cases; monitoring, isolating, and restricting movement of in-contact animals; and disinfection of potentially contaminated surfaces, and vaccination.

SPREAD OF DISEASES
Knowledge of how diseases are spread is important for prevention. The control of vector-borne (i.e. flies, mosquitoes, ticks, midges) transmission is targeted toward destroying the vector and using repellents.
Mosquito-borne diseases have the potential to spread rapidly in previously unaffected geographic regions as happened in 2011 when an unprecedented outbreak of encephalitis in horses occurred in south-eastern Australia, affecting over 1000 horses with a mortality of 10%–15%. It followed extensive flooding which promoted ideal conditions for freshwater mosquito breeding. Cases occurred throughout most of NSW, west of the Great Dividing Range and into the Hunter River valley region, Sydney Basin, the Illawarra, Victoria and South Australia. Evidence of infection was also found in Western Australia.

Flies can also transmit viruses and parasites. There are many types of control methods including biological methods, but no single method is effective in controlling stable fly populations. Sanitation is the most important method for reduction of stable fly populations in livestock farms. Most common larva sites are piles of decomposing vegetative material or manure, old manure under fences, and poorly drained areas. In confined animal facilities, the highest priority should be to eliminate stable fly breeding. Using long-acting, residual sprays can suppress populations, but their persistence is not predictable and some stable fly populations have already shown a high degree of resistance.

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PARASITE CONTROL
Parasite control is also a component of biosecurity, and all new horses should have a detailed history of deworming and be assessed for parasites via a faecal egg count (FEC). Worms increase their egg production around the time a mare foals (to increase the chance of infecting foals) and reduce their egg production when grass is sparse so its important to perform the FEC at the correct time.

MANAGEMENT

Disinfectants are an effective way to minimise infectious organisms in the environment – but thorough cleaning must be done first to remove dirt and organic materials before a disinfectant can be applied to the surface. No high pressure water is ever used for cleaning stables or floats because aerosolisation of infectious agents spreads them into other stables or the rafters. This type of equipment should not be used for cleaning when infectious organisms are likely. The appropriate dilution of the disinfectant and adequate contact time are key factors when using disinfectants.

In areas with little mud, manure or dirt, a 1:32 dilution of bleach is effective against most organisms, but in stables where organic matter cannot be completely eliminated, it is necessary to use a disinfectant that is specific for the disease agent and active in the presence of organic matter.

Disinfectants vary in their ability to kill organisms. There are some good resources to assist in selection but its easier to discuss with your veterinarian the best disinfectants for different organisms.

Outbreak investigations have indicated an association between infections and poor adherence to hand hygiene. Hand washing is also important to prevent chemical contamination with horse medicines, which can adversely affect people. Alcohol-based hand sanitiser can be useful, but hands must be washed in soap first. Additional actions include foot-baths but these are only effective if used consistently and stringently AND there is adequate contact time – usually 15 minutes! Separate, dedicated footwear is easier.

Australia has strict biosecurity measures to reduce the risk of disease entry – and with around 600 horses entering Australia by air transport each year (49% Thoroughbreds, 5% ponies, 14% Warmbloods, 6% Standardbred and 7% Arabs), biosecurity is essential. Similarly, when horses co-mingle at equine events or on properties, infection control measures — including personal hygiene and correct use of disinfectants — is essential and requires knowledge of how long bacteria, virus, or other disease agents survive, how to stop the agent from spreading from horse-to-horse or from stable-to-stable and how to undertake decontamination and disinfection.

Biosecurity is equally important for large and small properties as these viruses and conditions do not distinguish between racehorses, showhorses or the much loved paddock pony.

With their knowledge about the pathophysiology of infectious disease, infection prevention, control and epidemiology, your equine veterinarian is best placed to undertake a biosecurity assessment, provide comment on hygiene practices, any deficiencies in the stable and on what biosecurity precautions and measures are appropriate for each disease.

Unfortunately most of the time when veterinarians get called out for a biosecurity assessment it is because of an outbreak situation. Ideally an assessment should be performed under ‘normal conditions’.

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Dr Jen Stewart has been an equine veterinarian for more than 40 years and an equine nutritionist for more than 10 years. Jen has been developing premium formulas for studs, trainers and feed companies in Australia and around the world and regularly consults to leading international studs and trainers in various countries. Jen has spent a fair bit of time researching and being involved in nutritional management of developmental orthopedic diseases, colic, tying-up, laminitis, performance problems, post-surgery and other conditions. And is currently the only practicing equine veterinarian and clinical nutritionist in Australia.
Jen’s promise is to continue to BRING SCIENCE TO YOUR FEED BIN

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