

Implementing biosecurity in an equine environment

Author : PHILIP IVENS

Categories : [Vets](#)

Date : January 19, 2015

PHILIP IVENS MA, VetMB, CertEM(IntMed), DipECEIM, MRCVS advises on physical barriers and hygienic practices that can be undertaken to prevent transmission of disease between horses and protect their health

Summary

This article details what biosecurity is and how it can be applied to the equine setting. Common pathogens are used to illustrate practical advice on how to devise a biosecurity plan for different equine establishments. The role of a detailed risk assessment is outlined and based on this individual risk assessment, the author explains how to implement a practical biosecurity plan, with the isolation/ quarantine facility being at the heart of this plan.

Advice on how to deal with visitors to the yard, as well as when travelling to shows/competitions, is set out. A table of pertinent information to the common respiratory pathogens in the UK is also provided (**Table 1**), alongside a pictorial risk assessment temperature gauge and an example of a biosecurity poster for use at the yard.

BIOSECURITY is the principles, actions, precautions and protocols that protect the health of horses by preventing the transmission of disease through physical barriers and hygienic practices.

Biosecurity is protecting an individual horse, a yard community and national herd/ industry against

biological agents. It is a strategy of disease prevention – preventing the introduction of disease and/or controlling and preventing disease circulation within a herd or community, such as a yard.

Infectious disease prevention is important because there are welfare concerns and potential mortality of individual animals (for example, strangles). Prevention of infectious disease can only be successful at herd level – for example, at a yard or national level. Infectious disease can travel quickly between groups; successful biosecurity can contain the disease within a group and prevent it from spreading between groups. It is important to see the individual horse from an infectious disease standpoint as part of multi-layered hierarchical herd structure ([Figure 1](#)).

Equine infectious diseases use direct contact, aerosols of mucus and sneezing droplets, fomites (inanimate objects that carry organisms on their surface) and vectors (living entities that may carry the organism). Horses spreading disease are not always sick – for example, a horse carrying the strangles bacteria within its guttural pouch will shed strangles bacteria for many months to years and is externally healthy, thus acting as reservoir of that infectious agent.

A generic circle of infection can be used to illustrate to owners the complexity of infectious disease ([Figure 2](#)). Fomites are inanimate objects that can carry infectious diseases between horses. Examples of fomites are brushes, head collars, buckets/troughs, horse trailers, numnahs and stable doors. Examples of vectors include people, dogs, cats, other horses and wildlife. Without appropriate biosecurity measures, the cycle continues to spread disease.

How to develop an effective biosecurity programme

A biosecurity plan is no use if it is impractical and then cannot be adhered to by the people using the yard. The first step is a risk assessment for the individual horse/ yard ([Figure 3](#)). The aim is to clearly identify what particular concerns and disease transmission risks exist for an individual animal, herd and premise. This is best done by a questionnaire or a meeting.

Risk assessments

Animal risk factors to be considered are the age of the animal with foals, youngstock (one to five years old) and brood mares being of higher risk than adult horses (more than five years old).

The business of the yard should be considered, with horse dealer yard being highest risk followed by public stud, breaking yard, competition yard, livery yard, riding school with private stud and private leisure yards being the lowest risk. The number of horses on yard is also important, with the larger the yard the higher the risk.

Average frequency of new arrivals influences risk, with frequent arrivals (for example, more than once a month) posing much higher risk than arrivals once a year or less. The level of horses attending shows or visiting the yard for training also affects the yard's particular risk level. If horses

on the premises can physically touch horses on neighbouring yards, this is obviously risky.

We have devised a temperature gauge of risk that helps guide owners to assess their own risk ([Figure 4](#)).

An overall risk profile should be made, ideally at a yard level, and advice should be based on areas identified. A questionnaire-based approach is a good way of achieving this.

Identifying protocols for implementation

Practical and sensible recommendations then have to be made. In the real world few yards can implement all potential biosecurity measures, but even few targeted measures based on the risk profile of that yard can have a big improvement in the biosecurity of that yard.

A key step that is still unusual in the UK general horse population is the use of a quarantine/isolation facility ([Figure 5](#)). If the author could only make one recommendation, it would be to set up this facility. Ideally, the isolation stables should be in a separate building; if this is not possible then limit the shared air space between the isolation area and the general population.

Equip the facility with separate feeding, mucking out and grooming equipment if at all possible. Ideally, separate drains for emptying water buckets and separate muck heaps for disposing of bedding. If possible, the facility should be downwind (prevailing) of the main stable block. Access should be restricted to only essential personnel and all dogs, cats and horses should be kept away.

Protocol for new arrivals

The introduction of new horses is a common way of spreading unwanted infectious disease. Isolate all new arrivals for a minimum of 21 days. All new horses should have up-to-date equine influenza vaccination protocols (for example, the British Horseracing Authority or the Fédération Equestre Internationale).

Horses that have lapsed in the influenza vaccination status or not been protected before should complete the primary course (first two vaccines) and a further week elapsed prior to moving on to the main yard. Ideally, this should be completed before moving to the isolation unit.

A strangles blood test should be carried out at 14 days or greater into the isolation period as it takes this long for a horse to seroconvert to *Streptococcus equi* subspecies *equi*.

If the test result is negative – less than or equal to 0.2 optical density (OD) on A and C antigen – then the horse can leave isolation at 21 days after a clinical check to ensure the horse has no clinical signs. If the strangles serology is equivocal – 0.3 OD or 0.4 OD on either A or C antigen – then a paired sample needs to be taken in 10 to 14 days' time to see if it is a rising or

falling titre.

If time is of the essence then you can proceed straight to guttural pouch wash to rule out a carrier state. If the titre is equal or above 0.5 OD then a guttural pouch test needs to be performed to rule in or out strangles carrier state. The author would recommend an appropriate PCR and culture.

Ideally, an additional serology sample should be taken on day one, but this increases the cost of the screening programme and most people, in the author's experience, go for the one sample at day 14 or more of isolation. Ideally, each horse should have dedicated equipment to prevent spread between horses within isolation facility.

Additional measures for internationally travelling horses

New arrivals should have a negative swab result for contagious equine metritis, and a negative serology for equine viral arteritis and equine infectious anaemia.

Ensure stallions standing at stud or being used for artificial insemination are negative for all three diseases before breeding and check they remain free of infection with repeated swabs and blood samples. Ensure strict hygiene measures when handling horses for breeding – for example, wearing disposable gloves and using disposable equipment.

Visitors to the yard

Ideally, there should be only one entrance/exit into the yard marked as the main entrance. Parking should be away from the horses. In high health yards, such as studs, a record of visitors should be kept.

Horses travelling to events and shows

Horses should avoid sharing transport with horses from other yards. Buckets and water if possible should belong to the individual horse. Avoid nose-to-nose contact between horses. Wash hands after other horses are handled. Clean and disinfect boots and outer clothing after each show. If horses have been stabled at the show, depending on risk assessment, it may be prudent to keep the horses in the yard's isolation facility on returning.

Conclusion

Infectious disease is becoming more common with the increased density and movement of horses. Therefore biosecurity measures are increasingly important to stop an increase in infectious disease prevalence.

BEVA, in the wake of the equine herpes myeloencephalopathy outbreak(s) in the west of the country in 2013, put a checklist for owners for the horse's health. This valuable document can be found at www.beva.org.uk/news-and-events/news/view/371

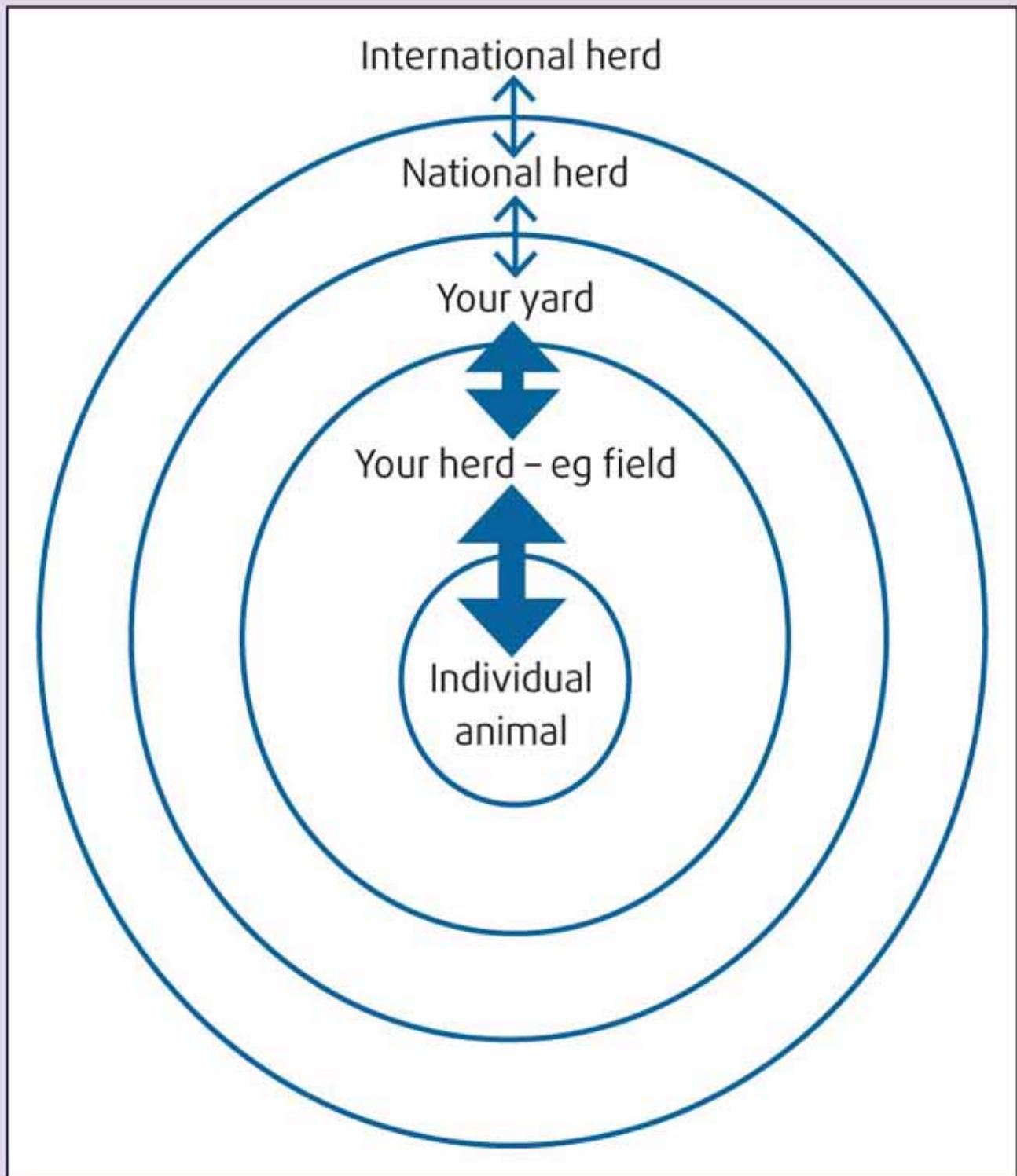


Figure 1. The different groups of horses on local, national and international level, and how disease can spread between each layer or be stopped by appropriate biosecurity measures.

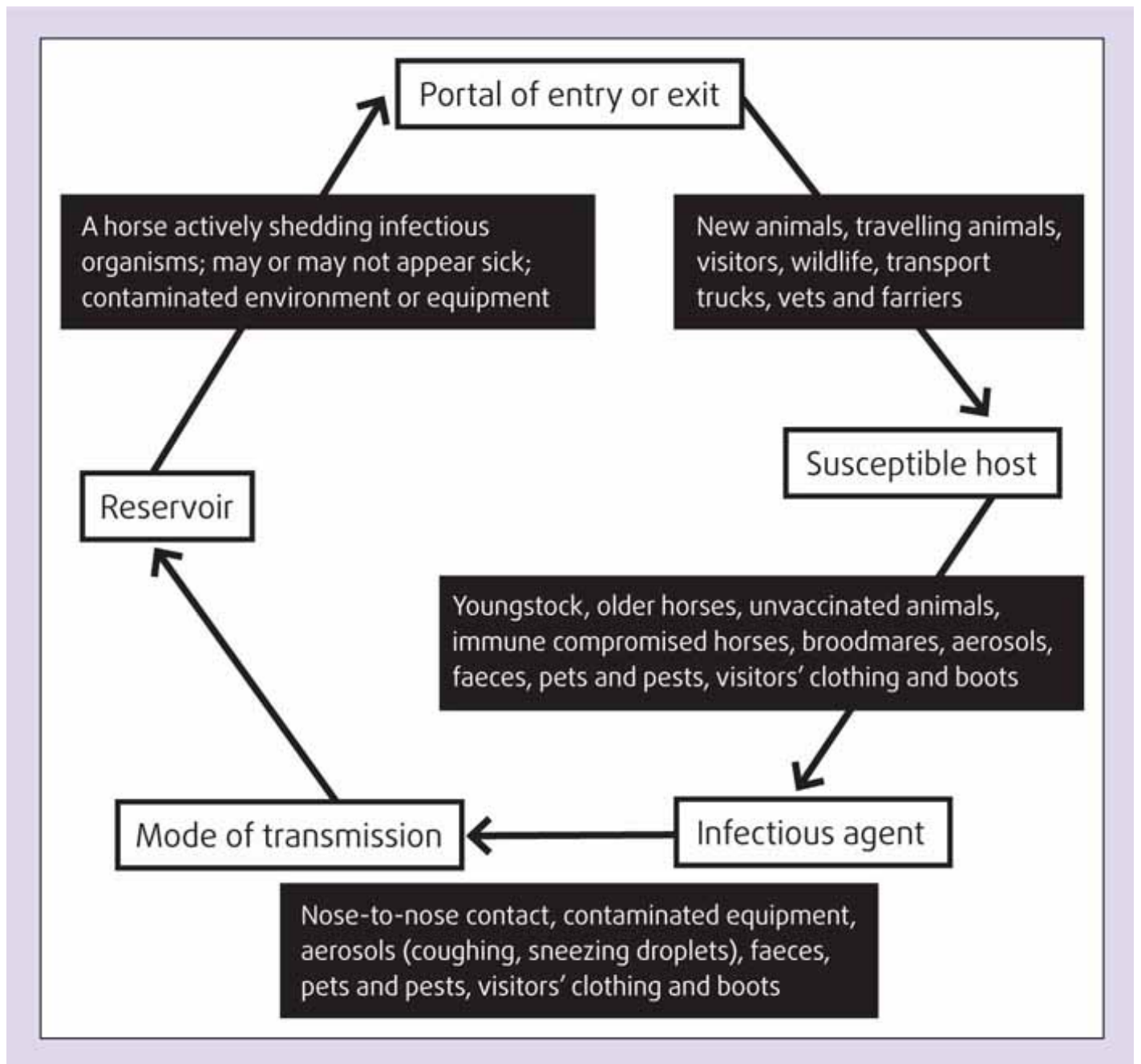


Figure 2. Circle of infection.

RESPIRATORY INFECTIOUS DISEASE YARD PROTOCOL

FILL IN THE BLANKS TO CUSTOMISE YOUR PREVENTATIVE YARD HEALTH PLAN

THE UK CHALLENGE

There are many respiratory diseases that affect horses. The key viral and bacterial diseases in the UK are:

- **'Flu'** (Equine Influenza)
- **Herpes** (EHV 1 and 4)
- **Strangles** (*Streptococcus equi*)

YARD NAME

ADDRESS

NUMBER OF HORSES

DATE

BIOSECURITY

A number of steps can help reduce the disease challenge to a group of horses. These steps include:

- Isolating new horses on yard – **21-28 days**
- Minimising contact with unknown health status horses
- Screening new horses e.g. identify strangles carrier status

YARD ACTIONS

New arrival isolation period ☐ days

Isolation location

Strangles carrier screening – Yes/No

VACCINATION

• **'Flu' – Booster Frequency**
Yearly ☐ Every 6 months ☐

• **Herpes – Yes/No**

• **Strangles – Yes/No**
Booster Frequency
Every 3 months ☐ Every 6 months ☐

VACCINATION

A great tool to reduce the disease challenge in at risk groups:

- **'Flu' – Primary course (3 injections) booster yearly or every 6 months (FEI rules)**
- **Herpes – Primary course (2 injections) booster every 6 months**
- **Strangles – Primary course (2 injections) booster frequency based on risk assessment below**

Strangles Risk Assessment Guide

Low risk (disease less likely)

High risk (disease more likely)

Single horse	Multiple horses	Multiple horses & owners	Large yard, livery yard
No contact with other horses	Occasional contact with horses of known health status	Regular contact with horses of known health status	Frequent contact with horses of unknown health status
No new arrivals into yard	New arrivals unusual	New arrivals several times each year	Frequent new arrivals, high throughput of horses
No previous strangles	No previous strangles	Previous strangles, but investigations for carriers	Previous strangles, no investigations for carriers
Annual health plans/preventive health plans in place	Quarantine of new arrivals with testing	Quarantine of new arrivals but no testing	No quarantine or testing of new arrivals
Separate water troughs			Communal water troughs, shared feed stores
No personnel traffic between horses, biosecurity in place	Little personnel traffic between horses, with biosecurity	Personnel traffic between horses, with biosecurity	Personnel traffic between horses, no biosecurity

If you are concerned horses have signs of respiratory disease, stop all yard movements, isolate the affected horse(s) and contact your vet.

MSD Animal Health, Welwyn Manor, Welwyn, Milton Keynes, MK7 7AJ Tel: 01908 848484
www.msd-animal-health.co.uk www.equine-strangles.co.uk

Equilis

strep^e



Figure 3. An example of a biosecurity poster for use at a yard.

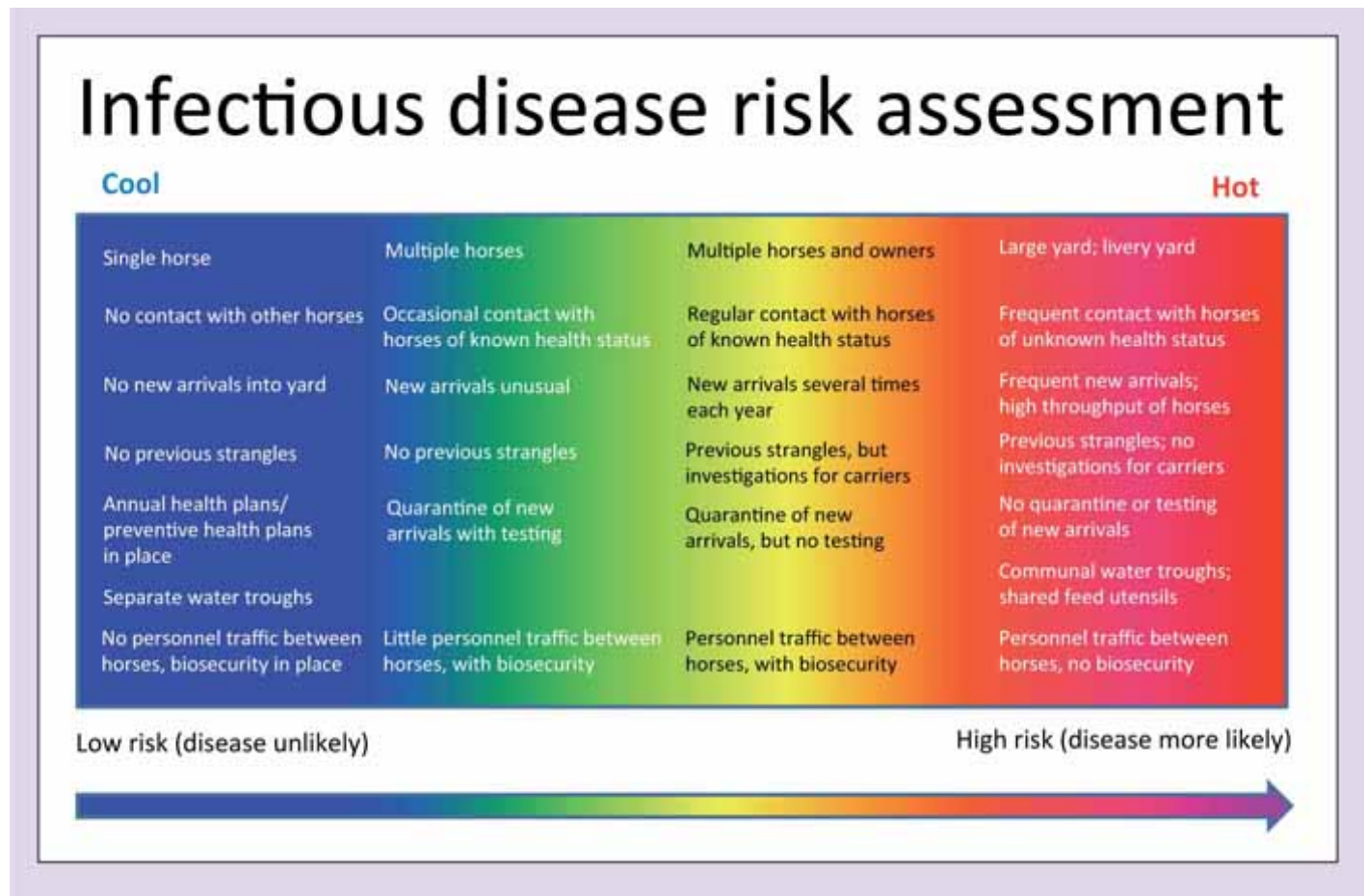


Figure 4. An infectious disease risk assessment temperature gauge.



Figure 5. The author recommends setting up a quarantine/isolation facility.

Disease	Pathogen	Incubation time	Transmission	Clinical signs	Diagnosis
Strangles	<i>Streptococcus equi</i> subspecies <i>equi</i>	2-21 days	Contact with infected bodily discharges. Fomites and water troughs/mangers are important vectors	Classical: depression, cough, thick purulent nasal discharge, fever and swollen painful facial lymph nodes. Atypical: milder symptoms, short-term fever, dullness, loss of appetite and mild nasal discharge. Increasingly common	Culture or PCR on nasal pharyngeal swabs, abscess or guttural pouch wash – often requires multiple samples. Serology
Equine influenza	Equine influenza virus	1-3 days	Aerosol (airborne droplets) spread on hands and equipment	Hacking dry cough, high fever and loss of appetite. Highly infectious and spreads rapidly	Virus or PCR on nasopharyngeal swab. Rising antibody levels in paired samples
Equine herpesvirus (EHV)	EHV-1 and EHV-4	Variable – horses become latent carriers and subsequently shed the virus	Close contact with infected animal or contact with fluids following abortion from the virus	Three syndromes: 1. Mild respiratory disease with cough, fever and nasal discharge. 2. Abortion – typically later in pregnancy. 3. Equine herpes myeloencephalopathy	Virus isolation on nasopharyngeal swabs or aborted fluids. Serology

Table 1. Common UK respiratory pathogens