Ministry for Primary Industries
Manatū Ahu Matua

Risk Management Proposal

Risk management proposal equids

LIVEQUID.GEN

[Document Date]

Growing and Protecting New Zealand

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Contents

1 Purpose

The purpose of this document is to:

- Show how options for the management of risk organisms have been assessed.
- Provide recommendations for import requirements.

2 Background

Equids are considered a risk commodity, with the potential to harbour exotic viral and bacterial diseases. In January 2000 the Ministry for Primary Industries (MPI) completed an import risk analysis (IRA) for horses and horse semen. The import health standard (IHS) applies to animals from the family *Equidae* and includes horses (*Equus caballus)*, donkeys (*Equus asinus*), mules and hinnies (*E. caballus x E. asinus*).

This amendment is the result of a review of the current requirements to ensure the recommendations are up to date. Where equids are required to meet *Code* recommendations in the standard, the requirements reflect the most current *Code*. When *Code* chapters are amended, MPI will review these changes to ensure they continue to align with New Zealand's appropriate level of protection (ALOP). Where recommendations no longer meet New Zealand's ALOP, *Code* recommendations will be replaced with risk-based MPI recommendations and the IHS will be amended. Otherwise the most recent version of the *Code* should be referred to.

In accordance with MPI processes, the IHS contains generic import requirements. These requirements manage the biosecurity risk of importing equids from approved countries. The generic IHS serves as the basis for country to country (bilateral) negotiations of country-specific veterinary certificates. A guidance document will be issued by MPI and this will provide commodity specific guidance information including samples of country specific bilaterally-agreed veterinary certification for trade in equids.

MPI will agree country specific veterinary certificates with the exporting country's Competent Authority once MPI is satisfied with the exporting country's export systems. Negotiations will take into account the verifiable health status of the exporting country, the national systems, legislation and IHSs in the exporting country for regulatory oversight of the equine industry, and the capabilities and preferences of the exporting country's Competent Authority. The assessments will be based on the World Organisation for Animal Health Code section 3, Quality of Veterinary Services.

3 Objective

The objective is to effectively manage biosecurity risks associated with the import of equids consistent with New Zealand's domestic legislation and international obligations.

4 Options assessment

Under Article 3.3 of the World Organisation for Animal Health (OIE) Agreement on the Application of Sanitary and Phytosanitary Measures (the SPS Agreement), risk management measures which provide a level of protection greater than provided by international standards may be imposed only when they can be scientifically justified on the basis of a risk assessment.

For a detailed analysis of potential hazards and their risks please refer to the supporting documents, *Import Risk Analysis: Horses and Horse Semen* which contains the relevant risk assessment and an analysis of management options for each risk organism.

Of the potential hazards, the IRA *Horses and Horse Semen* concluded that risk management measures were justified for the following hazards in imported equids:

- African horse sickness virus
- *Anaplasma phagocytophilium* and *Neorickettsia risticii* (equine granulocytic anaplasmosis and Potomac horse fever)
- *Bacillus anthracis* (anthrax)
- Borna disease virus
- *Burkholderia mallei* (glanders)
- *Burkholderia pseudomallei* (melioidosis)
- *Cochliomyia hominivorax* and *Chrysomya bezziana* (old and new world screwworm)
- Eastern and Western equine encephalomyelitis viruses (EEE/WEE)
- Ecto- and endoparasites
- Equine arteritis virus (EVA)
- Equine encephalosis virus
- Equine herpesvirus-1 (EHV-1)
- Equine infectious anaemia virus (EIA)
- Equine influenza virus
- Getah virus
- *Histoplasma capsulatum* var. *farciminosum* (epizootic lymphangitis)
- Horse pox virus
- Hendra and Nipah viruses
- *Hypoderma bovis* and *Hypoderma lineatum* (warble fly)
- Japanese encephalitis virus
- Leptospira spp.
- Rabies virus
- *Salmonella abortus equi*
- *Taylorella equigenitalis* (contagious equine metritis)
- *Theileria equi* and *Babesia caballi* (equine piroplasmosis)
- *Trypanosoma equiperdum* (dourine)
- *Trypanosoma evansi* (surra)
- Venezuelan equine encephalomyelitis virus
- Vesicular stomatitis virus
- West Nile virus

The following identified risk organisms were removed in previous amendments to the IHS as it was identified that specific risk management measures were either not required or no longer justified:

- *Anaplasma phagocytophilium* and *Neorickettsia risticii* (equine granulocytic anaplasmosis and Potomac horse fever)
- *Burkholderia pseudomallei* (melioidosis)
- Getah virus
- *Histoplasma capsulatum* var. *farciminosum* (epizootic lymphangitis)
- Horse pox virus
- Leptospira spp.
- West Nile virus

Identified risk organisms that have been removed in the 2018 major amendment to the *IHS: Horses* (now IHS Equids) are:

- Equine encephalosis virus
- Vesicular stomatitis virus

5 Summary of IHS amendments

5.1 June 2011 (first issue of the IHS)

(1) Based on recommendations from the risk team, *Anaplasma phagocytophilium* (equine granulocytic anaplasmosis)*, Neorickettsia risticii* (Potomac horse fever), Getah virus, and leptospirosis requirements were removed as they were no longer considered to be justified.

5.2 February 2013

(1) This was a minor amendment to the IHS and changes were made for equine viral arteritis (EVA), contagious equine metritis (CEM), equine influenza (EI), horse pox, epizootic lymphangitis and equine encephalosis:

a) For EVA, the requirements were aligned with the *Code* chapter for EVA.
b) For CEM, three changes were made:
    i) Colts were added to the animals excluded from requiring testing if they are accompanied by equivalent testing of their dam;
    ii) CEM sampling was changed to 'during the 30 days before export', from 'during the 30 days before entering PEI' to align with the *Code* and MPI's intention to require that testing occur before export;
    iii) CEM testing of pregnant mares was changed to allow sampling in the 60 days prior to mating/insemination, rather than 30 days which aligns with Australia's requirements.
c) For EI, two changes were made:
    i) A clause was added to not require vaccination of foals less than 6 months old if they are accompanied by documentation showing they have fully vaccinated dams;
    ii) The wording was clarified for agent identification testing in PEI.
d) For horse pox and epizootic lymphangitis, the requirements were removed based on the removal of the *Code* chapters for both diseases and the RMP recommended that no requirements were necessary.
e) For equine encephalosis, the requirement for serological testing was removed based on the recommendation of the risk team that pre-export isolation with vector protection was more than sufficient for risk management.

(2) It was also noted at the time that even though there was not a known vector for equine piroplasmosis in New Zealand, it was important to retain equine piroplasmosis requirements.

5.3 May 2014

(1) This was a minor amendment to the IHS and changes were made for EVA, CEM, melioidosis and West Nile virus (WNV), and a new document was added:

a) For EVA, the requirements were aligned with the *Code* chapter for EVA.
b) For CEM, the requirements were aligned with the *Code* chapter for CEM and the specific testing requirement for pregnant mares was removed. This change was consulted with the NZEHA.
c) For WNV, the requirements was removed. The *Code* chapter for WNV does not include specific requirements for equids as they are a dead-end host and measures are not warranted.
d) For melioidosis, the requirements were removed based on recommendations from the risk team that the likelihood of clinically healthy horses introducing the organism was considered to be very low and that the likelihood that imported infected horses could lead to establishment of the organism in New Zealand was concluded to be remote due the geographical restriction of the organism (i.e. confined to the tropics).

e) The document Approved Diagnostic Tests, Vaccines, Treatments and Post-arrival Testing Laboratories for Animal Import Health Standards (MPI-STD-TVTL) was created and added as a link to the IHS.

5.4 November 2015

(1) This was an urgent amendment to the IHS to include the Exporting Country Systems section of the IHS which was inadvertently omitted at a previous amendment.

6 General requirements for all importations of equids

6.1 Application

(1) The IRA scope includes live horses (*Equus caballus*), donkeys (*Equus asinus*), and mules/hinnies (*E. caballus x E. asinus*). The scope of the commodity is included in the IHS in *Part 1*, under application.

(2) The IHS applies to equids for import from approved countries into New Zealand.

6.2 Exporting country systems and certification

(1) All equids must be imported from countries where the Competent Authority has met the requirements of Part 1.5 of the IHS to the satisfaction of an MPI Chief Technical Officer (CTO).

(2) The evidence must include details about all of the following, that the CTO considers applicable to the equids from that exporting country:

a) The ability of the exporting country's Competent Authority to verify the animal health status of equids in the exporting country, zone, or compartment, with respect to the risk organisms identified in Part 2 of the IHS.
b) The adequacy of the national systems and/or programmes and standards in the exporting country for regulatory oversight of the equine industry.
c) The capability of the exporting country's Competent Authority to support the issue of veterinary certificates as required by the IHS.
d) Where applicable, the pre-export isolation (PEI) facility and operating protocols.

(3) The evidence will be obtained during evaluation of the Veterinary Services of the Competent Authority of the exporting country in accordance with section 3 of the *Code.*

(4) The CTO must be satisfied with the exporting country systems prior to preparation of equids for export to New Zealand. MPI reserves the right to audit facilities from countries approved to export equids to New Zealand either during the approval process or anytime thereafter.

(5) For exporting countries that MPI does not have existing arrangements with, MPI may choose to undertake in-country assessments and/or audit of PEI facilities prior to approval. The in-country assessment will assist in determining if the exporting country has animal and/or public health controls which provide the assurances the IHS requires for import of equids to New Zealand.

6.3 Disease freedom and residency

(1) Equids must be free from all quarantine restrictions prior to export to New Zealand.

(2) Equine disease free zone (EDFZ) freedom requirements will be specific to a particular organism/organisms. EDFZs must already be approved by the exporting country's Competent Authority prior to seeking MPI approval. EDFZs must be approved by the CTO before the option for a zone free from disease can be certified.

6.4 Diagnostic tests, vaccines, and treatments

(1) All diagnostic tests and vaccines must be approved by the CTO and listed in the document, *Approved Diagnostic Tests, Vaccines, Treatments and Post-arrival Testing Laboratories for Animal Import Health Standards MPI-STD-TVTL*.

(2) MPI approved diagnostic tests must be either described in the *OIE Manual of Diagnostic Tests and Vaccines for Terrestrial Animals* (the *Manual*) or will only be approved after consultation with MPI laboratory experts. When tests are not as per the *Manual* they must be considered by the MPI Animal Health Laboratory (AHL) as valid for diagnostic purposes in equids and must be appropriate for surveillance for the identified risk organism.

(3) All products and vaccinations administered to meet the specific disease requirements in *Part 2* of the IHS must be administered according to the recommendations of the manufacturer, unless otherwise stated, in a country that the CTO has agreed meet the requirements for export to New Zealand. All vaccinations must be either the final dose of a primary vaccination course or the recommended booster to complement the primary course.

6.5 Transport

(1) Trans-shipment in any third country may only occur if pre-approved by MPI and recorded on an import permit. In the case of equids transiting countries where there is a risk of insect borne pathogens the air stalls must be covered by insect-proof netting and the cargo hold sprayed with an effective insecticide during transit. The netting must be disinfected after arrival in New Zealand.

(2) No animals other than those that meet the import requirements for entry into New Zealand are permitted to be transported with the equids to the port of departure or on the aircraft or ship.

(3) Combined shipping of equids from multiple countries/locations with equivalent health status must be approved by MPI prior to import and recorded on the import permit. Only equids that require post-arrival quarantine can be co-shipped together.

(4) The vehicle in which equids are transported to the port of departure must be cleaned, disinfected and treated with an effective residual insecticide prior to loading the equids.

(5) The cargo space of all aircraft transporting equids must be disinfected and treated with an effective residual insecticide prior to loading the equids.

(6) Equids must be loaded into containers that are new or cleaned, disinfected and treated with an effective residual insecticide prior to loading the equids.

(7) Only sterile peat, soft board, treated wood shavings, shredded paper, or other inert products may be loaded for use as bedding during transportation. All feed and bedding during transportation must be free from weed seeds, and must be disposed of as biosecurity waste.

(8) All transport containers used during transport (e.g. air stalls and modified horse shipping containers) must be treated on arrival in New Zealand.

(9) Equids must arrive at an approved place of first arrival (POFA) for equids.

7 Considerations for specific requirements for identified risk organisms

(1) When equids are imported into New Zealand from countries where the identified risk organisms listed below are considered present and pre-export isolation is the agreed risk mitigation measure in the approved veterinary certificate, the duration and type of PEI is stated in brackets:

a) African horse sickness (minimum 14, 28, or 40 days PEI [depending on pre-export diagnostic testing] at a Competent Authority and MPI-approved and audited vector-proof premises)
b) Cattle tick infected country/zone (minimum 3 day PEI)
c) Equine influenza (minimum 21 days PEI)
d) Japanese encephalitis (minimum 21 days PEI protected from insect vectors)
e) Surra (minimum 21 days PEI protected from insect vectors)
f) Venezuelan equine encephalomyelitis, Eastern equine encephalomyelitis, Western equine encephalomyelitis (minimum 21 days PEI protected from insect vectors)

(2) When equids are imported into New Zealand from countries where the diseases listed below are considered present the duration and type of post arrival quarantine (PAQ) is stated in brackets:

a) Equine infectious anaemia (EIA) if considered by MPI as highly prevalent in the country of export (minimum 7 days PAQ)
b) Equine influenza (minimum 14 days PAQ)
c) Surra (minimum 30 days PAQ protected from insect vectors)
d) Venezuelan equine encephalomyelitis (minimum 7 days PAQ protected from insect vectors)

(3) When equids are imported into New Zealand from countries were the diseases listed below are considered present, the timing and type of testing is stated in brackets:

a) Equine infectious anaemia (OIE prescribed test or test listed in *MPI-STD-TVTL* for equids imported from countries where EIA occurs)
b) Equine influenza (agent identification test on nasopharyngeal swabs collected at least 5 days after entering PAQ)
c) Venezuelan equine encephalitis (virus isolation on blood samples collected from any equid showing a significant rise in temperature during PAQ).

8 Recommendations for identified risk organisms

8.1 African horse sickness virus

8.1.1 Risk management options presented in the current IHS: Horses

(1) For African horse sickness (AHS), the horses are from:

a) An AHS-free country or MPI-approved zone or seasonally free zone and have met the recommendations as described in the OIE *Code*; or
b) An AHS-infected/at-risk country or zone, or have transited through an infected country or zone, and have met the recommendations as described in the OIE *Code*.

8.1.2 Discussion

African horse sickness (AHS) is an OIE listed disease and New Zealand is free from AHS. It is endemic in tropical East and West Africa from where it regularly spreads to southern and occasionally to northern Africa. The incubation period is 7-14 days and death typically occurs within 4-5 days of onset of clinical signs. There is no effective treatment, but vaccines are available for all 9 types. AHS is non-contagious and natural transmission requires an intermediate host (*Culicoides* biting midges) that is not known to occur in New Zealand.

The biosecurity threat posed by AHS virus (AHSV) is considered to be negligible. This is because even if viraemic horses were imported, the disease is not contagious and the absence of the *Culicoides* vector means AHS could not establish. However, despite the negligible biosecurity risk, importing equids from endemic areas without measures would introduce seropositive or infected equids. An imported infected equid may develop severe clinical disease, including death. As a result, an exotic disease investigation would be required and other countries may impose trade measures on exports of New Zealand equids and semen.

The OIE officially recognises New Zealand as a Member country free of AHSV. To safeguard against trade measures being imposed, the *Code* recommendations would need to be adopted. This is because qualification as an AHS free country requires equids to be imported in accordance with the *Code* chapter on AHSV. Further, Article 12.1.2. states: an AHS free country or zone will not lose its free status through the importation of seropositive or vaccinated equids and their semen, oocytes or embryos from infected countries or zones, provided these imports are carried out in accordance with this chapter.

An update to the *Code* recommendations include provision for safe importation of equids from infected zones or countries through a combination of pre-export quarantine in a vector-protected quarantine facility and either serological or agent-identification testing while in quarantine. Article 12.1.3 of the *Code* regarding the use of seasonally free AHSV (AHS virus) zones has been removed because the OIE process for the official recognition of AHS freedom does not recognise seasonal freedom. Of note, the *Code* now contains a chapter on the *Application for Official Recognition by the OIE of Free Status for African Horse Sickness*.

The blanket 40 day vector-protected isolation prior to export has been removed and has been replaced by options of a specific vector-protected isolation period and testing or vaccination regime. Supervised exercise outside the vector-protected facility following prophylactic insecticide treatment, two hours after sunrise and two hours prior to sunset, could be safely allowed outside the *Culicoides* biting period which occurs from dusk until dawn. The testing requirements for serological testing for antibodies and antibody titres remain the same as the previous requirements. There are three prescribed serological tests for international trade, the competitive blocking ELISA, indirect ELISA, and complement fixation (CF). Although the CF test has been used extensively in the past, it is being replaced by many laboratories with ELISA screening techniques.

There are three PCR techniques included in the *Manual* for agent identification along with viral isolation (VI). Newer PCR techniques continue to be developed that have been shown to have a substantially greater sensitivity than that of VI which is currently considered to be the reference test for AHSV. As the incubation period for AHS is 7-14 days (but may be as short as two days in severe infections), and viraemia in challenged, vaccinated horses is detectable by PCR within 7 days, horses that could become infected before entering PEI would be identified through testing. Updated *Code* recommendations should be adopted.

8.1.3 Recommendation

(1) Equids must meet the recommendations in the *Code* chapter for *Infection with African horse sickness virus*.

8.2 *Anaplasma phagocytophilium* and *Neorickettsia risticii* (equine granulocytic anaplasmosis and Potomac horse fever)

8.2.1 Risk management options presented in the current IHS: Horses

(1) No specific measures.

8.2.2 Discussion

Both diseases were formerly referred to as equine ehrlichiosis. Potomac horse fever (PHF) and equine granulocytic anaplasmosis (EGA) are not OIE listed diseases. Neither of these diseases occur in New Zealand.

PHF is a sporadic disease of horses in North and South America and parts of Europe. The disease is not contagious, and infected horses develop clinical signs that include fever and diarrhoea with colic and laminitis in severe cases, and abortion in pregnant mares. Horses develop infection and disease after ingestion of aquatic insects including caddis flies. It appears that horses are accidentally infected by *N.*

risticii that normally cycles between trematode life stages in bats, freshwater snails, and aquatic insects. Infected horses develop a sterile immunity and so are unlikely to be a source of subsequent infection.

EGA is a seasonal disease of horses transmitted by *Ixodes* spp. ticks and has been reported in the USA, Canada, Brazil, and Europe. Clinical signs include fever, partial anorexia, depression, distal limb edema, petechiation, icterus, ataxia, and reluctance to move. Infected horses are unlikely to be reservoirs of the disease because the presence of the organism in an affected animal is generally limited to the acute phase of the disease. No vaccine is available and prevention is limited to tick-control measures. The *Ixodes* vector is not present in New Zealand. There are no measures in the current IHS as they were removed in a previous amendment.

8.2.3 Recommendation

(1) No specific measures are necessary.

8.3 *Bacillus anthracis* (anthrax)

8.3.1 Risk management options presented in the current IHS: Horses

(1) The horses were showing no clinical signs of anthrax at the final inspection prior to export and anthrax is notifiable in the country of export; and

(2) Were kept for the 20 days before export on premises where anthrax was not reported during that time; or

a) Were vaccinated not less than 35 days and not more than 6 months before export, as described in the document MPI-STD-TVTL. Antibiotics were not administered to the horses in the 7 days prior to and after vaccination and there was strict adherence to the manufacturer's instructions.

8.3.2 Discussion

Anthrax is a multiple species OIE listed disease and the *Code* recommends either premises freedom for 20 days prior to export or vaccination.

The incubation period for anthrax is 20 days and there is no evidence that anthrax is transmitted by animals before the onset of clinical and pathological signs. The premises freedom for 20 days manages the risk that equids will be incubating anthrax at the time of importation because of the low incidence, short incubation period, and obvious acute clinical signs of disease.

The *Code* recommendations include vaccination not less than 20 days and not more than 12 months before export which differs from the previous IHS recommendation of not less than 35 days and not more than 6 months. Updated *Code* recommendations should be adopted.

8.3.3 Recommendation

(1) Equids must meet the recommendations for equids in the *Code* chapter for *Anthrax*.

8.4 Borna disease virus

8.4.1 Risk management options presented in the current IHS: Horses

(1) The horses were kept since birth or for at least the 90 days prior to export in a free country; or

(2) The horses were kept since birth or for at least the 90 days prior to export on premises in which no case was reported during the past 12 months.

8.4.2 Discussion

Borna disease (BD) is an endemic, sporadically occurring disease caused by Borna disease virus (BDV). Borna disease is not an OIE listed disease. Clinically manifest BD is endemic in Central Europe (Germany, Switzerland, Austria, Liechtenstein), but infection has also been recognised in France and Sweden. Outside of Europe, detection of BDV antibodies and/or RNA has been reported in Japan, China, in the Middle East, as well as in an early report in the United States. The implications of serological findings on the actual distribution of BDV are uncertain.

It is assumed that intranasal infection via the olfactory nerve is the natural route of infection. More recently it is thought that the reservoir host of the disease may be the bicoloured white-toothed shrew (*Crocidura leucodon*) based on the correlation between the epidemiologic pattern of BD and the ecology and habitat range of the shrew. The transmission of BDV from reservoir to the end host most likely occurs in the stable, where more-intense contact with contaminated food or litter occurs. It has been noted that BD occurs more often on farms with mixed stock of horse, sheep, and cattle and lower hygiene standards. Most mammals and birds appear to be susceptible to BDV, although not all infections are followed by disease. There is no evidence that horses transmit infection to other animals or humans and BDV appears not to be readily transmitted beyond the endemic areas.

In accidental hosts such as horses and sheep, infection with BDV can lead to a neurological disorder due to a severe immune-mediated non-purulent meningoencephalitis. In Germany approximately 10% of infected horses develop clinical disease, however the majority of horses are subclinical. The incubation period is highly variable, typically 2-3 months, but can range from a few days to more than 12 months. The disease lasts for 3 to 20 days and mortality rate varies from 37-94%. A multitude of signs are observed and can typically be classified as depression and excitation, central sensory disturbances and motor disorders. Recovered horses often have permanent sensory or motor disturbances.

The consequences of an imported case are difficult to assess. A single imported case would have direct effects associated with the disease investigation. The investigation would need to trace-back to identify other possibly infected animals. If the animal had been imported some months previously trace-back could be difficult. Based on this information premises freedom recommendations should be maintained.

8.4.3 Recommendation

(1) Equids must be kept, since birth or for at least the 90 days prior to export, in a country recognised by MPI to be free from Borna disease; or

(2) Equids must be kept, since birth or for at least the 90 days prior to export, on premises in which no case of Borna disease was reported in the 1 year prior to export.

8.5 *Burkholderia mallei* (glanders)

8.5.1 Risk management options presented in the current IHS: Horses

(1) The horses were from a free country and have met the recommendations as described in the OIE Code for the importation of domestic equines; or

(2) The horses were from a country considered infected and have met the recommendations as described in the OIE Code for the importation of domestic equines.

8.5.2 Discussion

Glanders is an OIE listed disease. It is a contagious and often fatal disease of equids and is zoonotic with a very high fatality rate in humans. Zoonotic consequences would principally concern those persons with occupational exposure to infected animals. Transmission is by direct contact and the incubation period is days to months, with death in as little as a week, or chronic glanders that may progress over years.

There are no vaccines available and treatment in not recommended. Control measures normally include a stamping out policy. Equids imported from endemic areas could be infected with glanders, and this could result in an outbreak of disease here with significant consequences for the equine industries and for public health.

The distribution of disease is now limited and it has disappeared from many countries. However, it occurs sporadically in approved countries such as the USA and Germany.

The *Code* describes conditions for a country to be considered as free from glanders, and recommends 6 months residency for equids imported from such countries. Equids imported from infected countries should be subjected to 6 months premises of origin disease freedom and pre-export testing. *Code* recommendations should continue to be used.

8.5.3 Recommendation

(1) Equids must meet the recommendations in the *Code* chapter for *Glanders*.

8.6 *Burkholderia pseudomallei* (melioidosis)

8.6.1 Risk management options presented in the current IHS: Horses

(1) No specific measures.

8.6.2 Discussion

B. pseudomallei causes a disease of humans and animals that occurs predominantly in the tropical and subtropical regions of Asia and northern Australia. Melioidosis in horses normally manifests as an acute metastatic pneumonia with a fever. Infection usually causes a fatal septicaemia with the course of disease typically short, although horses may survive for several months.

It appears to be an opportunistic pathogen with infection acquired from the environment. The likelihood of clinically healthy horses introducing the organism is considered very low. Further, the likelihood that imported infected horses could lead to the establishment of the organism here is concluded to be remote. There are no measures in the current IHS as they were removed in a previous amendment.

8.6.3 Recommendation

(1) No specific measures are necessary.

8.7 *Cochliomyia hominivorax* and *Chrysomya bezziana* (new world and old world screwworm)

8.7.1 Risk management options presented in the current IHS: Horses

(1) The horses were from a country approved by MPI as free of screwworm fly; or

(2) The horses were from a country considered infested with screwworm fly and have met the recommendations as described in the OIE Code for importation, quarantine and transportation of horses.

8.7.2 Discussion

Cochlioma homnivorax (New World) and *Chrysomya bezziana* (Old World) are OIE listed diseases of multiple species. The *Code* recommendations when importing from infected countries include examination for infested wounds and prophylactic treatment of animals pre-export. Post-importation inspection is also recommended.

In the event of an introduction of screwworm leading to an outbreak during the summer months, significant adverse direct and indirect impacts could affect many livestock industries. There could also be public health implications. Establishment, however, is probably a remote likelihood since ground temperatures are too cold to allow screwworm pupae to survive over winter.

Code recommendations should continue to be used.

8.7.3 Recommendation

(1) Equids must be kept, since birth or for at least the 21 days prior to export, in a country recognised by MPI as free from New World and Old World screwworm and where no case of screwworm fly myasis was reported in the 1 year prior to export; or

(2) Equids must meet the recommendations in the Code chapter for *New World screwworm (Cochliomyia hominivorax) and Old World screwworm (Chrysomya bezziana)*.

8.8 Eastern and Western equine encephalomyelitis viruses (EEE/WEE)

8.8.1 Risk management options presented in the current IHS: Horses

(1) The horses were kept since birth or for at least the 40 days prior to export in a country where no case of EE has been reported in the past 12 months; or

(2) The horses were kept since birth or for at least the 40 days prior to export on premises where no case of EE was reported during that time; and

a) Were kept for a minimum 40 days before export in PEI and were protected from vectors at all times whilst in PEI and during transportation to the port of departure.

8.8.2 Discussion

Eastern and Western equine encephalomyelitis (EEE and WEE) are OIE listed diseases. Horses are 'dead-end' hosts for the EEE and WEE viruses and the mosquito vectors are not known to be present in New Zealand.

However, in order to prevent importation of clinical cases of EEE and WEE, horses should be protected from infection during the pre-export period. The *Code* recommends safeguards based on clinical freedom, 21 days insect-proof isolation, or vaccination. A declaration of 21 days of insect-proof isolation and clinical freedom on the day of export provides an effective safeguard because of the short incubation period of the disease (5-14 days) and the risk of a horse being infected with EEE or WEE in the 1-2 weeks prior to export can be managed by vaccination.

Currently, the IHS requires vaccination at least 35 days prior to travel to New Zealand. The updated *Code* recommendations including vaccination at least 15 days prior to travel and not more than one year prior to shipment should be adopted.

8.8.3 Recommendation

(1) Equids must be kept, since birth or for at least the 90 days prior to export, in a country recognised by MPI as free from EEE and WEE; or

(2) Equids must meet the recommendations in the Code chapter for *Equine encephalomyelitis (Eastern and Western)*.

8.9 Ectoparasites

8.9.1 Risk management options presented in the current IHS: Horses

(1) The horses were treated twice: first immediately on entry into PEI; and second in the 48 hours before the scheduled date of export. The product(s) used are highly effective against ectoparasites and were applied as described in the manufacturer's instructions.

(2) The horses were thoroughly examined in the 48 hours before export by a registered veterinarian; and

a) There was no evidence of tick infection; or

b) The horses were thoroughly examined in the 48 hours before export by a registered veterinarian and ticks were found. The horses were re-treated, and then re-inspected, and ticks were not found *.

* delete option b if the exporting country is not free of piroplasmosis

8.9.2 Discussion

Imports of live animals present a particular risk of introducing ectoparasites and this risk is typically managed through treatment and veterinary examination prior to export. The current IHS requires two treatments for ectoparasites (mosquitoes, biting flies, ticks, mites). The first, immediately on entry into PEI and the second, 48 hours prior to export. Where no PEI is required, equids must be treated once 48 hours prior to travel, with additional stabling requirements for equids from tick-infested areas. Inspection for ectoparasites is required in the 48 hours prior to export.

8.9.3 Recommendation

(1) Equids that do not require any PEI must:

a) Be treated within 24-48 hours prior to travel with a broad-spectrum ectoparasiticide effective against ticks and applied in accordance with the recommendations of the manufacturer; and

b) At the final inspection prior to export:

i) There must not be any evidence of ectoparasite infection; or

ii) If ectoparasites are found, the equids in the consignment must be re-treated, and then re-inspected no less than 48 hours after treatment, until no ectoparasites are found. *(If the exporting country is not free of piroplasmosis, this clause does not apply and equids must be free from ectoparasite infection at the inspection in the 24 hours prior to scheduled export*); or

(2) Equids that are imported from a cattle tick-infested area and do not require PEI for any other identified risk organisms must:

a) Be thoroughly examined for ticks prior to entry into PEI under the supervision of the Official Veterinarian. A thorough and systematic approach must be used including a close visual and tactile examination of the ears, false nostrils, under-body areas (axilla, inguinal region, and under the jawbone), perineum, mane and tail; and
b) Be kept in PEI for the 3 days prior to export and be fully stabled at all times; and
c) Be maintained tick free for the entire duration of PEI; and
d) Be treated twice with a broad spectrum ectoparasiticide effective against ticks applied in accordance with the recommendations of the manufacturer, the first treatment prior to entry into PEI and the second treatment within 48 hours prior to travel; and

e) At the final inspection prior to export:

i) There must not be any evidence of ectoparasite infection; or

ii) If ectoparasites are found, the equids in the consignment must be re-treated, and then re-inspected no less than 48 hours after treatment, until no ectoparasites are found. *(If the exporting country is not free of piroplasmosis, this clause does not apply and equids must be free from ectoparasite infection at the inspection in the 24 hours prior to scheduled export*); or

(3) Equids that require PEI for identified risk organisms other than ectoparasites must:

a) Be thoroughly examined for ectoparasites within 24 hours after entry into PEI under the supervision of the Official Veterinarian. A thorough and systematic approach must be used including a close visual and tactile examination of the ears, false nostrils, under-body areas (axilla, inguinal region, and under the jawbone), perineum, mane and tail; and

b) Be treated twice for ectoparasites:

i) The first treatment must be given within 24 hours after entry into PEI after ectoparasite examination; and

ii) The second treatment must be given within 24-48 hours prior to export; and

c) The product(s) used must be a broad-spectrum ectoparasiticide effective against ticks and applied in accordance with the recommendations of the manufacturer; and

d) At the final inspection prior to export:

i) There must not be any evidence of ectoparasite infection; or

ii) If ectoparasites are found, the equids in the consignment must be re-treated, and then re-inspected no less than 48 hours after treatment, until no ectoparasites are found. *(If the exporting country is not free of piroplasmosis, this clause does not apply and equids must be free from ectoparasite infection at the inspection in the 24 hours prior to scheduled export*).

8.10 Endoparasites

8.10.1 Risk management options presented in the current IHS: Horses

(1) The horses were treated twice: first immediately on entry into PEI; and second in the 48 hours before the scheduled date of export. The product used is a highly effective broad spectrum endoparasiticide and was applied as described in the manufacturer's instructions.

8.10.2 Discussion

Imports of live animals present a particular risk of introducing endoparasites and this risk is typically managed through treatment prior to export. The current IHS requires two treatments for endoparasites (small strongyles, large strongyles, ascarids, tapeworms). The first, immediately on entry into PEI and the second, 48 hours prior to export. Where no PEI is required, equids must be treated once 48 hours prior to travel.

8.10.3 Recommendation

(1) Equids that do not require any PEI must be treated within 24-48 hours prior to travel with a broad spectrum anthelmintic and applied in accordance with the recommendations of the manufacturer; or

(2) Equids that require PEI must be treated within 24 hours after entry into PEI with a broad spectrum anthelmintic applied in accordance with the recommendations of the manufacturer.

8.11 Equine arteritis virus (equine viral arteritis)

8.11.1 Risk management options presented in the current IHS: Horses

(1) Uncastrated male horses have met the recommendations as described in the OIE Code for the importation of uncastrated male horses; or

(2) Horses other than uncastrated males have met the recommendations as described in the OIE Code for horses other than uncastrated males.

8.11.2 Discussion

Equine viral arteritis (EVA) is an OIE listed disease and occurs worldwide. In June 2014, New Zealand declared freedom from EVA to the OIE. This means applying *Code* measures to all imported equids is justifiable.

Natural infection is followed by a long-lasting immunity, but subclinical infection is very common. Vaccination reduces the risk of contracting acute infection and subsequent shedding. Acutely infected horses will shed the virus for a short time only, but during this time will expose in-contact equids to infection. This is the only means by which mares and geldings could introduce infection. The greatest exposure risk results from shedder stallions. Importation of a shedder stallion or his semen would lead to infection in inseminated mares. Exposure of New Zealand equids to EVA could lead to endemic cycles of subsequent respiratory shedding, further acute infections, and potential long-term persistence in shedder stallions.

The *Code* makes recommendations for the safe importation of equids and their germplasm. For EVA, the *Code* requires equids to show no clinical signs of disease on the day of shipment and during the 28 days prior to shipment must meet the requirements under the recommendations for either the importation of uncastrated male equids or equids other than uncastrated males. Recommendations for uncastrated males centre around antibody titre testing, vaccination, and in the case of seropositive stallions, EVA testing of semen.

In the case of foals less than 6 months old, maternal immunity can interfere with serologic testing and vaccination. While subclinical infection is relatively common for adult equids, infection in foals is often clinical so if a foal was infected it is more likely to have had clinical disease. Un-weaned foals under 180 days of age are not required to undergo testing and vaccination if accompanied by their dam with documentation showing the dam has met all requirements for EVA.

All other equids must meet recommendations based on testing, vaccination or pre-export isolation. *Code* recommendations should continue to be used.

8.11.3 Recommendation

(1) Equids, excluding unweaned foals under 180 days of age, must meet the recommendations in the *Code* chapter for *Infection with equine arteritis virus*.

8.12 Equine encephalosis virus

8.12.1 Risk management options presented in the current IHS: Horses

(1) The horses were kept since birth or for at least the 40 days before export in a country where no case of EE has been reported during the past 2 years; or

(2) The horses were kept since birth or for at least the 40 days before export on premises where no case of EE has been reported during the past 12 months; and

a) The horses were kept for at least the 40 days before export in PEI and were protected from vectors at all times whilst in PEI and during transportation to the port of departure.

8.12.2 Discussion

Equine encephalosis (EE) is a non-contagious disease of equids caused by the equine encephalosis virus (EEV); it is not an OIE listed disease and is not notifiable in New Zealand. Serological surveys suggest that EE is endemic in equids in most parts of South Africa, Botswana, Namibia, Zimbabwe and Kenya. The seroprevalence in southern Africa is more than 75% in horses and 85% in donkeys. In 2009, an outbreak of EE occurred in Israel. EEV is transmitted by *Culicoides spp*. midges and *C. imicola* is

regarded as the main vector of EEV. There are seven serotypes of EEV and equids can be simultaneously with multiple strains. No vaccines are available.

All equids are susceptible to EEV, but clinical signs are only seen in horses. The incubation period is 2-6 days and the viraemic period is generally brief at 5-7 days. The majority of EEV infections are subclinical or horses show only mild signs of the disease. Clinical signs can include inappetance, fever, mucous membrane congestion and icterus. In some severe cases, infected horses may show clinical signs similar to those seen in African horse sickness. The mortality rate is less than 5% and horses do not act as long-term carriers of the virus.

The consequences of a single imported case of EE would probably be limited to short-term direct consequences associated with the disease investigation. Some indirect consequences associated with stopping exports of equids and semen until a diagnosis was established could occur. A PCR test is available in South Africa and the test can be grouped with an AHSV PCR into a single process for the test to be run in parallel.

Consequences would be confined to the equine industries and would probably not continue after a definitive diagnosis was established. This scenario is unlikely since the vast majority of infections are subclinical or clinical signs if observed, are very mild. The disease would not establish in New Zealand since it is not contagious and the vector (*Culicoides* midges) is not known to be present.

8.12.3 Recommendation

(1) It is recommended the measures for EE be removed. No specific measures are necessary.

8.13 Equine herpesvirus-1 (EHV-1)

8.13.1 Risk management options presented in the current IHS: Horses

(1) The horses were showing no clinical signs of EHV-1 infection (abortigenic and paralytic forms) at the final inspection prior to export and were kept for at least 21 days before export in premises where no case of EHV-1 infection (abortigenic and paralytic forms) was reported during that time.

8.13.2 Discussion

EHV-1 is an OIE listed disease. The *Code* provides recommendations for EHV-1 but not for other equine herpesviruses.

Outbreaks of neurological disease in horses caused by EHV-1 have been reported with increasing frequency in the USA in recent years, caused by an emerging mutant strain of EHV-1. This strain was considered to be exotic to New Zealand despite free trans-Tasman trade where the abortigenic and paralytic form is present in Australia. However, in 2015 an outbreak of the neurologic form occurred and surveillance suggests this strain might also be present in New Zealand.

The *Code* recommendations would not prevent introduction of the organism because latently infected animals are the main reservoir of infection and can reappear at times of stress. However, they would safeguard against importing equids in the acute phase of infection.

The *Code* measures would help prevent international spread from an active outbreak since the incubation period ranges from 2 days to 2 weeks. This would mean a reduction in the premises freedom/residency requirement in current IHS's of 3 months to 21 days. This will reduce the risk of importing animals that have been recently exposed. Animals must be free from clinical signs. *Code* recommendations should continue to be used.

8.13.3 Recommendation

(1) Equids must meet the recommendations in the *Code* chapter for *Infection with equid herpesvirus-1 (Equine rhinopneumonitis)*.

8.14 Equine infectious anaemia virus (EIA)

8.14.1 Risk management options presented in the current IHS: Horses

(1) The horses have met the recommendations as described in the OIE *Code*.

(2) Samples for testing were collected in pre-export isolation or in the 21 days prior to export if PEI is not required.

8.14.2 Discussion

EIA is an OIE listed disease. The incubation period is 1-3 weeks, but may be as long as 3 months. Infection is persistent and the animal remains infectious for the rest of its life. Subclinical infections are common, and most chronically infected equids experience periods of remission. Transmission occurs by transfer of blood; mechanically by insects (*Stomoxys calcitrans* is an important vector that is present in New Zealand); transfer from mare to foal in utero; or spread iatrogenically.

Introduction and establishment of EIA would result in direct adverse impacts from the initial investigation and efforts to control or eradicate the disease, and the clinical effects of disease. Indirect consequences would probably be limited, as EIA is present in most countries New Zealand exports equids to.

New Zealand currently requires post-arrival quarantine and further testing which is beyond the *Code*. The risk analysis states that when importing from medium to high prevalence countries, post-arrival quarantine for periods of 7-14 days with repeat serological testing during this period will reduce risk of infected animals being introduced. This is considered justified for New Zealand in order to maintain our status as free from EIA.

For equids travelling for short stays to Australia (less than 21 days), animals may return to New Zealand without measures being imposed. The rationale from the risk analysis is that the serological test would not be reliable and that a premises freedom declaration would be sufficient. EIA is notifiable in Australia.

Although the OIE does not recognise country freedom, New Zealand has not reported any cases for two decades and wants to maintain this status. Therefore, requirements slightly above *Code* recommendations are justified. Serological testing should be carried out closer than the *Code*-recommended 30 days prior to travel, to maximise time for antibody development and test sensitivity.

8.14.3 Recommendation

(1) Equids must not show any clinical signs of EIA within 48 hours prior to export; and

a) Equids must be kept, since birth or for at least the 90 days prior to export, on premises where no official case of EIA is reported during that period; and
b) Equids must be subjected to a diagnostic test for EIA as described in the document *MPI-STD-TVTL* with negative results. Samples for testing must be collected within the 21 days prior to export.

8.15 Equine influenza virus (EI)

8.15.1 Risk management options presented in the current IHS: Horses

(1) The horses were from an EI-free country, have met the recommendations as described in the OIE *Code*, and EI vaccination is not practised in the exporting country, with the exception of horses for export to a third country; or

(2) The horses were from a country considered infected with EI or where EI is not notifiable and have met the recommendations as described in the OIE *Code* (including additional security recommendations), except samples for agent identification testing were collected on two occasions, the first taken 5-7 days after entry into PEI and a second sample taken not less than 5 days later

8.15.2 Discussion

Equine influenza is an OIE listed disease that occurs widely throughout the world. It is a highly contagious disease that is transmitted directly from acutely infected to susceptible equids. The incubation period is 1-5 days and animals remain infectious for 7-10 days. Rapid transportation of equids over long distances by air is attributed as a key factor in the spread of EI. Vaccines are widely available and routinely used.

The likelihood of EI being introduced into New Zealand through live equid imports is high, and an outbreak would have serious and long-term consequences for the equine industries. EI has never been recorded in New Zealand and vaccination is not practised leaving the equine populations here fully susceptible. Explosive disease outbreaks are likely within New Zealand's immunologically naïve equine populations. EI is the infectious disease that probably presents the most serious economic threat to the New Zealand equine industries. The total overall cost of direct and indirect effects is likely to be very high.

New Zealand accepts the *Code* criteria for country freedom, but will require a high degree of confidence in freedom claims, particularly where vaccination for EI is practised in the general population.

Vaccines should contain OIE recommended strains, which are reviewed annually by the OIE expert working group for EI. Unweaned foals under 180 days of age are not required to be vaccinated if accompanied by their dam with documentation showing the dam has met all requirements for equine influenza.

Since 2007, the quick and sensitive nasal swab PCR test has been included in pre- and post-arrival quarantine in New Zealand import health standards. The PAQ testing is considered an important measure for New Zealand, since one of the key concerns with importing equids from an EI infected country is subclinical infections that may occur in vaccinated animals. New Zealand opts for the additional security measures recommended in the *Code*; samples for agent identification testing are collected on two occasions in the 5-7 days after entry into PEI and in the 4 days prior to shipment. The additional measures will be required for equids not from a free country, zone, or compartment, and where equids are from an EI free country, zone, or compartment where vaccination is practiced. *Code* recommendations should continue to be used.

8.15.3 Recommendation

(1) Equids must meet the recommendations in the *Code* chapter for *Infection with equine influenza virus* including the additional security testing.

(2) EI vaccines must contain equivalent strains of EI virus as recommended by the OIE Expert Surveillance Panel on Equine Influenza Vaccine Composition: http://www.oie.int/en/our-scientific-expertise/specific-information-and-recommendations/equine-influenza/.

8.16 Getah virus

8.16.1 Risk management options presented in the current IHS: Horses

(1) No specific measures.

8.16.2 Discussion

Infection with Getah virus is mostly subclinical or causes only mild clinical signs that quickly fully resolve. There is no evidence that horses are able to infect vectors (*Aedes vexans nipponi* and *Culex tritaeniorynchus*), which in any case are not present in New Zealand at this time. There is no evidence of

natural transmission from horses so it is concluded that they are most likely dead-end hosts. Thus infection is generally subclinical, self-limiting and of little consequence to the horse. There are no measures in the current IHS as they were removed in a previous amendment.

8.16.3 Recommendation

(1) No specific measures are necessary.

8.17 Hendra and Nipah viruses

8.17.1 Risk management options presented in the current IHS: Horses

(1) The horses were kept since birth or for at least the past 90 days in a country approved by MPI as free of Hendra and Nipah; or

(2) The horses were kept since birth or for at least the past 90 days in premises where no case of infection in animals or humans has been reported during that time; and Hendra and Nipah are notifiable in the country of export; and horses were showing no clinical signs of infection with Hendra and Nipah virus at the final inspection prior to export.

8.17.2 Discussion

Hendra virus and Nipah virus belong to the same genus (*Henipavirus*). Pteropid bats (flying foxes) are the reservoir hosts for both diseases. Hendra virus is a rare sporadic infection of horses and humans that occurs in a geographically restricted part of Australia (Queensland and New South Wales). Nipah virus outbreaks have occurred in the tropics, Singapore, India, Bangladesh, and Malaysia, but these are rare and sporadic. Malaysia has remained free since eradication 10 years ago.

For Nipah virus, the likelihood of importing infected horses is extremely low and the likelihood of establishment is considered remote. For Hendra virus, the risk of introduction is probably higher than for Nipah virus. However, despite this, the IRA recommended testing for Nipah virus, but not for Hendra virus. At the time the IRA was written, the scientific evidence available was insufficient and a precautionary approach for Nipah virus had been taken. Since then, an OIE publication reports that serological surveillance carried out in Malaysia in 1999 and 2000 found the entire horse population was free from Nipah virus infection. Further, 500 horses in Singapore were tested and found to be seronegative for Nipah virus.

A horse returning a positive result on Nipah serological testing can occur as a result of spill-over from close contact with infected pigs. It is noteworthy that a serologically positive horse is an extremely rare event, even in horses located within an outbreak zone. Based on updated technical advice from the risk analysis team the serological test for Nipah virus was not recommended and was previously removed from the IHS.

Hendra virus causes a rare sporadic infection of horses and humans that has currently occured in a geographically restricted part of Australia (Queensland and New South Wales). Hendra virus belongs to the genus *Henipavirus*. Pteropid bats (flying foxes) are the reservoir hosts for the disease. In the past 25 years since the discovery of the disease in 1994, there have been 84 confirmed cases in a population of over one million horses (https://www.business.qld.gov.au/industries/service-industries-professionals/service-industries/veterinary-surgeons/guidelines-hendra/incident-summary). The disease has a restricted range of occurrence in Queensland and New South Wales and within this area, cases have occurred on just over 50 individual properties. No horse intended for export to any country or jurisdiction has ever been infected with Hendra virus. From January 2006 to July 2018, a total of 11,551 horses travelled from Australia to New Zealand with no evidence of Hendra virus infection.

Due to the level of exposure required, although having significant consequences, the disease is not categorised as highly infectious to humans or horses. Transmission from horse to other horses or humans results from direct contact with infectious bodily fluids such as blood, urine, saliva or nasal discharge from

an infected horse or by contact with surfaces or equipment contaminated with infectious material. Close direct contact is needed for transmission to occur.

A total of seven humans have contracted Hendra virus from infected horses, and four of these people did not survive. The seven confirmed human cases all became infected following high level exposures to respiratory secretions and/or blood of a horse infected with Hendra virus, following activities such as assisting with post mortem examination of a dead horse without adequate personal protective equipment (PPE), performing certain veterinary procedures or having extensive exposure to respiratory secretions without adequate PPE, usually when the horses were very ill during the peak viral shedding period (https://www.health.nsw.gov.au/Infectious/controlguideline/Pages/hendra-case-summary.aspx).

Other people have reported similar contact with infected horses but have remained well and their blood tests have shown no evidence of infection. No one with a lower level exposure (e.g. grooming, feeding, patting) has ever developed Hendra virus infection or shown evidence of infection in blood tests. Several hundred people have been exposed to Hendra virus infected horses but have not been infected. The last human case of Hendra virus infection occurred in 2009 and despite a large number of horse cases in 2011, no human cases were recorded.

Since the discovery of Hendra virus, Australia has provided educational information about the disease, proper hygiene and infection control which have been the mainstay of prevention of further human cases. The greatest risk is with clinically ill horses. The recommended prevention measures to take when horses are unwell are:

- Cover any cuts or abrasions on exposed skin before handling horses and wash your hands well with soap and water, especially after handling a horse's mouth or nose and before eating, smoking or touching your eyes, nose, mouth.
- Don't kiss horses on the muzzle (especially if the horse is sick)
- Use personal protective equipment to protect yourself from the body fluids of horses.

In Australia, horse owners or persons dealing with horses have a general biosecurity obligation to take all reasonable and practical measures to prevent or minimise the effects of a biosecurity risk. This means they are legally required to reduce the risk of Hendra virus infection and limit the spread of Hendra virus when dealing with horses and other possible carriers. This would include horse exporters and their staff. Persons dealing with horses should be taking the proper precautionary measures during the import of horses from Australia including having proper access to PPE and should discuss this with their employer.

A vaccine for Hendra virus has been available in Australia since 2012. It has subsequently proven highly effective in protecting against natural challenge. There are no reports of any vaccinated horse becoming infected with Hendra virus. Further, experimental studies whereby vaccinated horses were exposed to massive amounts of the virus did not become infected. Approximately 600,000 doses of the vaccination have been administered since its release and approximately 150,000 individual horses have been vaccinated. There has been an accumulation of strong scientific evidence demonstrating the efficacy of the vaccine which means that a vaccination option can now be included as a viable risk management option for trans-Tasman trade.

Based on the available information, the previous requirements for Hendra should be maintained with an additional option to use vaccination to meet biosecurity requirements.

8.17.3 Recommendation

For Nipah virus:

(1) Equids must be kept since birth or for at least the 90 days prior to export in a country recognised by MPI as free from Nipah; or

(2) Equids must be kept since birth or for at least the 90 days prior to export in premises where no case of infection in animals or humans has been reported during that period, and Nipah is notifiable in the country of export; or

For Hendra virus:

(1) Equids must be kept, since birth or for at least the 90 days prior to export, in a country recognised by MPI as free from Hendra; or

(2) Equids must be kept, since birth or for at least the 90 days prior to export, in premises where no case of infection in animals or humans has been reported during that period, and Hendra is notifiable in the country of export; or

(3) Equids must be vaccinated against Hendra virus in accordance with the recommendations of the manufacturer not less than 14 days and not more than 1 year prior to export.

8.18 *Histoplasma capsulatum* var. *farciminosum* (epizootic lymphangitis)

8.18.1 Risk management options presented in the current IHS: Horses

(1) No specific measures.

8.18.2 Discussion

Epizootic lymphangitis is a disease caused by infection with the dimorphic fungus *Histoplasma capsulatum* var. *farciminosum* (previously *Histoplasma farciminosum*). The *Code* chapter for epizootic lymphangitis has been removed as it does not meet the criteria for listing. There are no measures in the current IHS as they were removed in a previous amendment.

8.18.3 Recommendation

(1) No specific measures are necessary.

8.19 Horse pox virus

8.19.1 Risk management options presented in the current IHS: Horses

(1) No specific measures.

8.19.2 Discussion

Horse pox virus causes an unimportant disease that may no longer exist. The *Code* removed the chapter in 2010 as it did not meet the criteria for listing. There are no measures in the current IHS as they were removed in a previous amendment.

8.19.3 Recommendation

(1) No specific measures are necessary.

8.20 *Hypoderma bovis* and *H. lineatum* (warble fly myiasis)

8.20.1 Risk management options presented in the current IHS: Horses

(1) The horses were kept since birth or for at least the 90 days prior to import in a country/zone where no case of warble fly has been reported during the past 12 months; or

(2) The horses were showing no clinical sign of warble fly disease at the final inspection prior to export and were treated with an ectoparasiticide approved by the Veterinary Authority as capable of killing warble fly larvae, applied as described in the manufacturer's instructions during the 48 hours prior to export.

8.20.2 Discussion

Warble fly infestation is caused by larvae of *Hypoderma bovis* and *H. lineatum*. They infect cattle, deer and occasionally horses. Importation of live equids from endemic regions could lead to the introduction of warble flies. Establishment and spread of warble fly in temperate regions such as Chile, Great Britain and Norway suggest that this would be possible under New Zealand conditions if infested animals were released. Significant direct and indirect impacts would be likely for livestock industries, in particular the cattle industries.

Current standard practice as presented in the IRA should be maintained which includes country freedom or treatment in the 48 hours prior to export.

8.20.3 Recommendation

(1) Equids must be kept, since birth or for at least the 90 days prior to export, in a country/zone recognised by MPI as free from warble fly, and where no case of warble fly has been reported in the 1 year prior to export; or

(2) Equids must be treated with an ectoparasiticide approved by the Competent Authority as capable of killing warble fly larvae, applied as described in the recommendations of the manufacturer within 48 hours of export and the equids must not show clinical signs of warble fly disease at the final inspection prior to export.

8.21 Japanese encephalitis virus

8.21.1 Risk management options presented in the current IHS: Horses

(1) The horses have met the recommendations as described in the OIE *Code*.

(2) The required vaccination was administered at least 35 days prior to export.

(3) Samples for testing were collected in pre-export isolation or in the 21 days prior to export if PEI is not required.

8.21.2 Discussion

Japanese encephalitis is an OIE listed insect-borne viral disease. Equids do not develop viraemia of sufficient titre to infect mosquitoes, and are considered dead-end hosts. Direct transmission does not occur so there is no risk that importation of an infected equid would lead to further cases in other livestock or humans. While *Culex* sp. mosquitoes exist in New Zealand, none of those species involved in JE transmission cycles in Asia occur here. There is very little risk of endemic cycles establishing here.

The biosecurity threat posed by JE is considered to be negligible. Nevertheless, measures have been recommended in the IRA to protect from the indirect consequences associated with disruption of trade over the short period until the disease investigation established a diagnosis. The measures from the IRA are beyond the *Code* which does not require PEI if the animal has been vaccinated.

The risk analysis team investigated vaccine efficacy in 2005/06. It was concluded that vaccination is very efficacious. This was based on there being only two cases of clinical JE virus in vaccinated horses in Hong Kong documented. One case occurred in 1981 and the other in 2000. Japan had not reported any clinical cases since 1986 up to 2005/06. The possibility of a vaccinated equid developing clinical signs within pre- or post- export isolation is extremely low.

New Zealand's import measures are based on preventing sick animals in post-arrival quarantine (although an unlikely event). Updated *Code* recommendations should be adopted.

8.21.3 Recommendation

(1) Equids must be kept, since birth or for at least the 21 days prior to export, in a country recognised by MPI as free from JE; or

(2) Equids must meet the recommendations in the *Code* chapter for *Japanese encephalitis*.

8.22 *Leptospira spp.* (leptospirosis)

8.22.1 Risk management options presented in the current IHS: Horses

(1) No specific measures.

8.22.2 Discussion

The *Code* chapter for leptospirosis has been removed as it does not meet the criteria for listing. Measures are not scientifically justified as horses are not considered to be maintenance hosts for any serovar. Also, antibiotic treatments have not been properly evaluated in horses, and diagnostic testing is not suitable as an import condition. There is sufficient accumulated evidence to warrant the removal of all restrictions in the case of leptospirosis and horses. There are no measures in the current IHS as they were removed in a previous amendment.

8.22.3 Recommendation

(1) No specific measures are necessary.

8.23 Rabies virus

8.23.1 Risk management options presented in the current IHS: Horses

(1) The horses were from a free country and have met the recommendations as described in the OIE *Code* for the importation of domestic equines; or

(2) The horses were from a country considered infected and have met the recommendations as described in the OIE *Code* for the importation of domestic equines.

8.23.2 Discussion

Rabies is an OIE listed disease of multiple species. The virus can infect all mammals, including humans. Transmission is by direct inoculation from an infected animal, particularly from bites and scratches. After onset of signs the course of disease in horses is very short, ranging from 1 to 7 days. Nervous signs progress and invariably lead to death or euthanasia. There is no treatment for clinical rabies. Vaccines are available and vaccination is commonly practised in endemic regions.

Equids imported from endemic areas could be incubating the disease. The consequences of an imported case would probably be confined to persons exposed to imported animals. Some consequences associated with the disease investigation could also be expected. Measures during importation of equids are warranted.

The *Code* recommends that imported equids should have been resident since birth or at least the last 6 months prior to export in a country or establishment where no case was reported for at least the last 12 months prior to export. It also makes recommendations for the use of vaccination along with permanent identification. The current *Code* does not make provisions for an incubation period when considering the use of vaccination as a way to meet rabies requirements. According to the *Code* chapter on rabies, the incubation period is considered to be 6 months.

It is recommended that the updated *Code* recommendations be adopted.

8.23.3 Recommendation

(1) Equids must meet the recommendations in the Code chapter for *Infection with rabies virus*.

8.24 *Salmonella abortus equi* (equine salmonellosis)

8.24.1 Risk management options presented in the current IHS: Horses

(1) For equine salmonellosis (Salmonella abortus equi) the horses were kept since birth or for at least the 90 days prior to export on premises where no case of equine salmonellosis has been reported during that time.

8.24.2 Discussion

Equine salmonellosis is not an OIE-listed and not many countries impose import measures mitigating the organism. This organism is rarely encountered in developed countries. An exception is a particular region in Japan where there is a control program in place. Vaccination has contributed to the virtual eradication of this disease in many countries. The clinical syndromes of infection are typically easy to recognise. Subclinical carriers are important in spreading the disease.

The consequences of *S. abortus equi* introduction would be confined to the equine industries. They would include the initial disease effects, such as abortion storms and high foal mortality rates, as well as the costs of investigation and control. Overseas experience suggests that the disease could be controlled and eradicated. Measures against equids and semen exports would probably be imposed by trading partners.

8.24.3 Recommendation

(1) Equids must be kept, since birth or for at least the 90 days prior to export, on premises where no case of equine salmonellosis (*S. abortus equi*) has been reported during that period.

8.25 *Taylorella equigenitalis* (contagious equine metritis)

8.25.1 Risk management options presented in the current IHS: Horses

(1) For contagious equine metritis (CEM) the stallions and mares (excludes geldings, and pre-pubertal fillies and colts that are less than 731 days of age if accompanied by documentation showing equivalent CEM testing of their dams):

a) Were from a CEM-free country, approved by MPI; or

b) Were considered free from CEM; an official control programme for CEM or MPI-approved equivalent is established in the country of export; and horses have met the recommendations as described in MPI-STD-TVTL (or pre-mating testing followed recommendations in MPI-STD-TVTL but was done in the 60 days prior to mating or artificial insemination); or

c) Have been known to be infected with CEM and were subject to an effective method of treatment and testing approved by MPI.

8.25.2 Discussion

Contagious equine metritis (CEM) is an OIE listed disease and the *Code* makes recommendations for the safe importation of stallions and mares. The *Code* refers to the clinical syndrome (CEM) without mentioning the causative agent. The *Manual* states that the causative agent for CEM is *Taylorella equigenitalis*, for which the prescribed test is culture. Prior infection or vaccination are not fully protective and the control of infection relies entirely on prevention of transmission through the detection of *T. equigenitalis* on swabs of the reproductive tract of stallions and mares.

Culture cannot distinguish between *T. equigenitalis* and *T. asinigenitalis* and this requires a specialised PCR which is available only in a few laboratories. The *Code* recommendations are therefore aimed at excluding both T. *equigenitalis* and *T. asinigenitalis* and separate measures for these two organisms are not recommended for the generic IHS. Despite the existence of a number of PCR assays, which are more sensitive and faster in diagnosis, none has been validated by the OIE for use as a routine diagnostic test. MPI however has accepted PCR based on information from MPI's laboratory experts and from Professor Sydney Ricketts.

There are no additional testing requirements for imported pregnant mares above other categories of equids imported into New Zealand. Under the updated CEM testing requirements, transitional facilities for CEM testing of mares are no longer required or used and the Transitional Facilities for CEM Testing of Mares standard has been revoked.

Australia in August 2013 changed their import conditions regarding CEM to swabbing on two occasions at least four days apart if the animal didn't have a history of infection. The amendment of the horse IHS on 22 May 2014 aligned the CEM testing protocol with the Australian and United Kingdom Horse Betting and Levy Board (HBLB) Code of Practice. Current recommendations should continue to be used in conjunction with CEM testing protocols as per the HBLB Code of Practice (2014).

8.25.3 Recommendation

(1) Equids must be kept, since birth or for at least the 60 days prior to export, in a country recognised by MPI as free from contagious equine metritis (CEM), and where no case of CEM has been reported in the 2 years prior to export; or

(2) The equid is a gelding or a foal less than 180 days old accompanied by their dam; or

(3) Equids must:

- a) Be kept, since birth or for at least 60 days prior to export on premises where no case of CEM has been reported during that period; and
- b) Must have no contact with CEM directly, through breeding (naturally or via artificial insemination) with an infected equid, or indirectly by passing through an infected premises, during the 60 days prior to export; and
- c) Must be subjected to a test for CEM in the 30 days prior to export, with negative results;
  - i) Stallions and colts must be sampled two times at intervals of 4-14 days. Sampling sites are the urethra, urethral fossa and its sinus, and the penile sheath;
  - ii) Mares and fillies must be sampled two times at intervals of 4-14 days. Sampling sites are the clitoral fossa and sinuses; and
- d) Must not receive antibiotics within 7 days (systemic treatment) or 21 days (local treatment) before the first sample collection or during the CEM sampling period; and
- e) Must not be naturally mated or inseminated with semen from a CEM-untested stallion since the date of first sampling for CEM.

8.26 *Theileria equi* and *Babesia caballi* (equine piroplasmosis)

8.26.1 Risk management options presented in the current IHS: Horses

(1) The horses have met the recommendations as described in the OIE Code.

(2) Samples for testing were collected in pre-export isolation or in the 21 days prior to export if PEI is not required.

8.26.2 Discussion

Equine piroplasmosis (EP) is an OIE listed disease caused by the tick-borne protozoa *Theileria equi* and *Babesia caballi*. Piroplasmosis can also be transmitted iatrogenically. Horses infected with *T. equi* remain

infected for life, whereas horses infected with *B. caballi* are seropositive from several years to life. *B. caballi* and *T. equi* share many of the same tick vectors, and frequently co-infect horses. *B. caballi* and *T. equi* are transmitted by more than 15 species of the tick genera *Dermatcentor, Hyalomma,* and *Riphecephalus*. *T. equi* can also be transmitted by *Boophilus microplus* and *Ambylomma cajennense*. Ticks serve as a reservoir for *B. caballi*; horses are the only known reservoir for *T. equi.*

EP is found globally where the tick vectors are present, and is endemic in tropical, subtropical, and some temperate regions, Australia and New Zealand are free from EP. In most endemic regions, infections with *T. equi* are generally more common than with *B. caballi.*

Infection may be subclinical, or horses may only show mild clinical signs. Chronic infection is very common so any previously infected equid (as reflected by serology) should be considered to potentially be a carrier of piroplasmosis. There are no vaccines available and although a number of drugs are available to treat the disease, none are satisfactory for the elimination of *T. equi* infections. Infection with *B. caballi* has been said to be self-limiting, however many horses that recover later relapse. Carrier horses represent a potential reservoir for maintenance and dissemination of parasites to ticks and horses. Because new tick species capable of transmitting equine piroplasms are being recognised and reliable control methods do not currently exist, it is important to prevent the introduction of both infected horses into EP-free areas.

The *Code* makes recommendations for the importation of equids including diagnostic testing for equine piroplasmosis with negative results and freedom from ticks during the 30 days prior to shipment. According to the *Manual*, the indirect fluorescent antibody test (IFAT) and the competitive enzyme-linked immunosorbent assay (cELISA) are the primary tests used for qualifying horses for importation. The complement fixation test (CFT), for many years the primary test, has been replaced by the IFAT and cELISA. These tests have proven to be more effective at detecting long-term infected animals and animals treated with antiparasitic drugs.

8.26.3 Recommendation

(1) Equids must be kept, since birth or for at least the 30 days prior to export, in a country recognised by MPI as free from equine piroplasmosis, that does not permanently import seropositive equids, and where no case of equine piroplasmosis has been reported in the 2 years prior to export; or

(2) Equids must meet the recommendations in the *Code* chapter for *Equine piroplasmosis* and the ectoparasite requirements of this IHS.

8.27 *Trypanosoma equiperdum* (dourine)

8.27.1 Risk management options presented in the current IHS: Horses

(1) The horses were from a free country and have met the recommendations as described in the OIE *Code* for the importation of domestic equines; or

(2) The horses were from a country considered infected and have met the recommendations as described in the OIE *Code* for the importation of domestic equines.

8.27.2 Discussion

Dourine is an OIE listed disease. Dourine is the only trypanosome not transmitted by an insect (invertebrate) vector and is transmitted directly from animal to animal via sexual contact. It can also be transmitted from a pregnant mare to her foal during delivery. Equids are the reservoir host for dourine. The incubation period, severity and duration of disease vary considerably; it is often fatal, but spontaneous recoveries may occur and latent carriers exist. Further, subclinical infections also occur. There is no treatment or vaccine for dourine.

Imports of equids from endemic areas could lead to introduction and establishment of dourine. The consequences of introducing dourine would include significant direct and indirect effects. There would be

clinical disease in infected equids, and any infected equid would be considered a lifelong carrier. Experience in other countries indicates control and eradication would be possible given the appropriate resources. Other countries would impose trade measures on exports of live equids and semen.

The *Code* recommends that equids should either be imported from countries free from dourine, or if imported from endemic countries, should be free from clinical signs of disease and test negative for dourine. The complement fixation test is prescribed for international trade since antibodies are always present even if clinical signs of disease are not evident. The *Manual* also describes an indirect fluorescent antibody test (IFAT) and enzyme-linked immunosorbent assay (ELISA) test which are approved by MPI in the *MPI-STD-TVTL* for the importation of equids. *Code* recommendations should continue to be used.

8.27.3 Recommendation

(1) Equids must meet the recommendations in the *Code* chapter for *Dourine*.

8.28 *Trypanosoma evansi* (surra)

8.28.1 Risk management options presented in the current IHS: Horses

(1) The horses were kept since birth or for at least the 60 days prior to export in a country where no case of surra has been reported during the past 2 years; or

(2) The horses were kept since birth or for at least the 60 days prior to export on premises where no case of surra has been reported during that time; and

a) Were kept for a minimum 30 days before export in PEI and were protected from vectors at all times whilst in PEI and during transportation to the port of departure.

b) Were subjected to diagnostic test(s) as recommended by the MPI document MPI-STD-TVTL for surra, with negative results from samples collected in the 10 days after entry into PEI.

8.28.2 Discussion

Surra is an OIE listed disease of multiple species caused by the protozoan parasite *Trypanosoma evansi*, however there are no *Code* recommendations.

New Zealand does not currently import equids from countries where the disease is endemic. The geographic distribution of surra indicates that, while tropical and sub-tropical climates are more favourable, infection may also establish and persist in temperate climates such as New Zealand's. *Stomoxys calcitrans*, a competent mechanical vector of surra, and susceptible host species, particularly horses, cattle and deer, are widely distributed in New Zealand. These factors combine to suggest that transmission of *T. evansi* could occur here. The possibility that endemic infection may establish here cannot be excluded. Indirect consequences resulting from trading partners imposing measures during exports of live animals are also likely.

Currently, the only prescribed test for international trade is the mouse inoculation, which is no longer ethically practicable. Australia currently requires 60 days residency on premises with no clinical cases for 12 months and testing using ELISA and microhematocrit centrifugation if the exporting country is not considered free from surra. A period of 30 days PAQ will increase the likelihood of clinical disease manifesting at some point during the period of PEI and PAQ supervision.

The measures as they are currently should be maintained.

8.28.3 Recommendation

(1) Equids must be kept, since birth or for at least the 60 days prior to export, in a country recognised by MPI as free from surra, and where no case of surra has been reported in the 2 years prior to export; or

(2) Equids must be kept, since birth or for at least the 60 days prior to export, on premises where no case of surra has been reported during that period; and

a) Must be kept for a minimum of 30 days prior to export in PEI and protected from vectors at all times whilst in PEI and during transportation to the port of departure; and

b) Must be subjected to diagnostic tests for surra with negative results, from samples collected in the 10 days after entry into PEI.

8.29 Venezuelan equine encephalomyelitis virus (VEE)

8.29.1 Risk management options presented in the current IHS: Horses

(1) The horses were from a free country and have met the recommendations as described in the OIE Code for the importation of domestic equines; or

(2) The horses were from a country considered infected and have met the recommendations as described in the OIE Code for the importation of domestic equines.

8.29.2 Discussion

VEE is an OIE listed disease that is restricted to the Americas. VEE viruses infect equidae, humans, birds, rodents, dogs, bats, rabbits, marsupials and non-human primates. In humans the disease is often fatal. Mortality rates in horses differ with the strain of the virus; during epidemics it may be 40-80%. VEE has never occurred in New Zealand.

Equids are considered amplifying hosts for epizootic VEE. With regards to enzootic variants, these are considered non-pathogenic to equids and cycle between rodents and mosquitoes. Equids infected with endemic VEE do not appear to play a significant role in the epidemiology of endemic VEE. The infective period is short and viraemia ends with the production of neutralising antibodies around 1-2 weeks after infection. Vaccination of equids in endemic areas and in areas at risk of epizootics reduces the risk of importing viraemic equids.

The potential for New Zealand insect species to act as vectors of VEE has not been tested, but *Culex* spp. with proven arbovirus vector competence do occur here and VEE viruses are able to infect a wide-range of insect species. Endemic VEE cycles are however unlikely to establish in New Zealand since cycles have never established outside of the non-temperate areas of the Americas.

The *Code* makes recommendations for the importation of equids from VEE free countries. This requires certification that during the past 6 months equids have not been in any country in which VEE has occurred in the last 2 years; that equids have not been vaccinated against VEE within 60 days of export. For equids imported from infected countries, recommendations are given for vaccinated and unvaccinated animals. Updated *Code* recommendations should be adopted.

8.29.3 Recommendation

(1) Equids must meet the recommendations in the *Code* chapter for *Venezuelan equine encephalomyelitis*.

8.30 Vesicular stomatitis virus

8.30.1 Risk management options presented in the current IHS: Horses

(1) The horses were resident for at least the 21 days prior to export in a country that is free of VS, and met the recommendations as described in the OIE *Code*; or

(2) The horses were from a country considered infected with VS, and have met the recommendations as described in the OIE *Code*, except the results of testing indicate horses have negative, stable or declining titres.

8.30.2 Discussion

Vesicular stomatitis (VS) was removed from the *Code* in 2015. The likelihood of entry of VS for live animals is assessed to be very low, and the exposure assessment considered to be negligible. Overall the risk of transmission through live animal imports is assessed to be negligible. Since there are reliable and rapid diagnostic tests available, the concerns around VS triggering a foot and mouth disease (FMD) response are no longer valid. Infection is primarily insect-born and there are no known vectors present in New Zealand. As equids do not get FMD, it is unlikely that an equid showing clinical signs associated with possible infection with the FMD virus would trigger an investigation.

8.30.3 Recommendation

(1) It is recommended the measures for VS are removed in alignment with the *Code*. No specific measures are necessary.

8.31 West Nile virus

8.31.1 Risk management options presented in the current IHS: Horses

(1) No specific measures.

8.31.2 Discussion

West Nile virus (WNv) had not been assessed in the IRA 2000 because at that time the virus was newly emerging and not recognised as a significant disease of horses. West Nile fever (WNF) is an OIE listed disease of multiple species.

In 1999 WNv spread to North America. Before 1999 WNv was confined to the Eastern Hemisphere. An increased incidence of neurological disease and a higher case fatality rate was associated with this virus. Consequently, WNF has emerged as a significant human and veterinary health concern, particularly in the Americas and Europe.

The *Code* makes recommendations for other susceptible species and specifically excludes equids. The *Code* also states that a free country or zone will not lose its status through the importation of seropositive animals (whether from natural infection, or vaccination induced). There is no biosecurity risk posed by equids regarding WNF. There are no measures in the current IHS as they were removed in a previous amendment.

8.31.3 Recommendation

(1) No specific measures are necessary.