Ministry for Primary Industries
Manatū Ahu Matua

Risk Management Proposal

Zoo Rodents from Australia, the European Union and the United States of America

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Contents

Purpose **1**

Background **1**

Objective **1**

Recommendations for Identified Risk Organisms **1**

Brucella abortus, *B. suis* (brucellosis) 3

Leptospira spp (leptospirosis) 3

Salmonella spp (salmonellosis) 4

Babesia microti (babesiosis) 4

Trypanosoma evansi (surra) 5

Echinococcus spp (hydatids) 6

Ticks (*Ixodes*, *Amblyomma* spp) 6

Weed Seeds 7

Purpose

This Risk Management Proposal (RMP) presents the rationale for decisions made by the Ministry for Primary Industries in developing the Import Health Standard (IHS) for Zoo Rodents from Australia, the European Union and the United States of America. This RMP accompanies the draft IHS during formal consultation to provide the rationale reflected in the draft IHS. The IHS has been developed under section 22 of the Biosecurity Act.

Specifically, this document presents the risks associated with four species of zoo rodents from Australia, the European Union, and the United States of America, and outlines the options considered for managing those risks. The options are discussed along with recommendations for import requirements based on that assessment.

Background

Commodity definition

The term 'zoo rodent' in this document, the risk analysis and the IHS refers to four specified rodent species nominated by the Zoo and Aquarium Association (ZAA) in July 2008. The source countries considered are Australia, the United States of America, and the European Union.

The 'commodity' covered by this document and the associated IHS is defined as the following 4 species of rodents from the countries listed above;

- African crested porcupine: *Hystrix cristata, Hystrix africaeaustralis*
- Brazilian agouti: *Dasyprocta leporina, Dasyprocta aguti*
- Capybara: *Hydrochoerus hydrochaeris (Hydrochaeris hydrochaeris)*
- Patagonian mara: *Dolichotis patagonum*

The commodity definition explicitly excludes rodents that have been caught in the wild, and rodent species that are potentially pets or pests. The risk analysis requires that all imported rodents must be clinically healthy and originate from premises under veterinary supervision.

Objective

The objective is to manage to an acceptable level all biosecurity risks posed by the importation of zoo rodents of the specified species from the specified countries in a way that is consistent with New Zealand's domestic legislation and international obligations.

Recommendations for identified risk organisms

Forty five pathogens or groups of pathogens that could be introduced via imported rodents were considered to be of potential concern. This pathogen list is essentially the same as that in a policy review for importing zoo rodents produced by Biosecurity Australia.

To assess the risk from particular pathogens, each pathogen was subjected to an initial examination of the likelihood of its introduction in the commodity. Pathogens meeting the following criteria were eliminated from the list;

- The pathogen does not occur in any of the countries to which this risk analysis applies.

- The pathogen does not occur in any of the species covered by this risk analysis.

The resulting list of pathogens was termed the ‘preliminary hazard list’. Each of these was subjected to a full risk assessment.

- Arenaviruses
- Hantavirus
- Sendai Virus
- Sialodacryoadenitis Virus
- Enteric bacteria
- *Brucella abortus*, *B. suis*
- *Coxiella burnetti*
- *Francisella tularensis* (tularemia)
- *Leptospira* spp
- *Mycobacterium bovis* (Tuberculosis)
- *Salmonella* spp
- *Yersinia pestis* (sylvatic plague)
- *Babesia microti* (babesiosis)
- Weed seeds
- *Coccidia* spp
- *Trypanosoma evansi* (Surra)
- *Echinococcus* spp (hydatids)
- Ticks *Ixodes, Amblyomma* spp
- Botfly (*Cuterebra* spp)

After initial risk assessment, this list was further reduced to eight pathogens that were considered as potential hazards in the commodity.

Special considerations

The special considerations applicable to the risk assessment and risk management processes are described here.

To be eligible for import, the Biosecurity Act 1993 requires MPI to be satisfied that the imported animals do not harbour potentially harmful organisms. A pre-export requirement of current IHSs is that animals must be certified by an Official Veterinarian on the day of travel to be showing no clinical signs of infectious or parasitic disease.

All specified zoo rodent species imported into New Zealand must be directed into permanent zoological containment facilities. Zoo rodents must have been born in and been continuously resident in a government registered or licensed zoo or wildlife park.

Brucella abortus, B. suis (brucellosis)

Analysis

The following points have been considered when drafting options to manage the risks associated with introduction of *Brucella abortus* and *B.suis* in the commodity:

B. abortus and *B. suis* have been isolated from capybaras in Venezuela. No reference was found to infection with brucellae of any of the other zoo rodent species proposed to be imported.

The agents of brucellosis are exotic, notifiable organisms that cause serious diseases of cattle and humans.

Risk management options for *Brucella* spp from risk assessment

One or a combination of the following measures could be considered in order to effectively manage the risk:

- Zoo rodents could be required to have originated from premises where brucellosis has not been diagnosed in any resident species in the last 3 years.
- Zoo rodents could be subjected to a World Organisation for Animal Health (OIE) recommended serological test for brucellosis with negative results during the 30 days pre-export isolation (PEI).

Recommendation

Although this is a notifiable organism that could cause serious disease in cattle and humans, the risk of the organism in the commodity from registered zoos or wildlife parks from the approved countries is considered negligible. No measures are required.

Leptospira spp (leptospirosis)

Analysis

The following points have been considered when drafting options to manage the risks associated with introduction of leptospirosis in the commodity;

Rodents, particularly rats, are the main reservoir hosts of many leptospire species, some of which are exotic to New Zealand. There is evidence that some large rodents, including agouti and capybara, may be carriers and may succumb to disease.

In 2009 the OIE deleted the chapter on leptospirosis after concluding that they are *"unable to formulate meaningful measures to manage the disease".*

Subsequently, MPI drafted a *Review of Leptospirosis Measures in Import Health Standards*, which recommended:

- No serological testing or antigen identification of any imported animals.
- Antibiotic treatment of imported animals only when the species is known to be a maintenance host and where there are properly evaluated antibiotic treatments that exist. For zoo animals - no treatment (unless the species is a recognised maintenance host, e.g. rodents).

Recommendation

During the 30 days PEI, all zoo rodents for import should be treated with 10mg/kg doxycycline by IM injection once daily for 3 days, or an MPI-approved equivalent.

Salmonella spp (salmonellosis)

Analysis

The following points have been considered when drafting options to manage the risks associated with introduction of salmonellosis in the commodity;

Rodents, along with other animal species including humans, can be infected with many *Salmonella* species and serovars.

Animals infected with *Salmonella* spp may carry the organism for long periods and excrete the organism intermittently in their faeces, without demonstrable clinical signs. Carriers of infection can be detected by culturing faecal samples, but because excretion is intermittent, repeated sampling and culture is necessary.

A PCR is available for rodents. This assay detects but does not differentiate most serotypes of *Salmonella* bacteria.

The requirement that zoo rodent species be kept in containment facilities will significantly limit the exposure of both people and other animals to any associated *Salmonella.*

Risk management options for *Salmonella* spp from risk assessment

Since many *Salmonella* serovars occur in New Zealand and because the small numbers of imported zoo animals are not regarded as important in the epidemiology of salmonellosis, clinically healthy zoo rodent species could be imported without restrictions.

Recommendation

The small numbers of clinically healthy zoo rodents imported pose a negligible risk, so no measures are required. This is consistent with other live animal IHSs.

Babesia microti (babesiosis)

Analysis

The following points have been considered when drafting options to manage the risks associated with introduction of *Babesia* in the commodity;

Human babesiosis is a significant but uncommon disease caused by the rodent strain *Babesia microti* in the United States.

B. microti has been detected in a number of rodents. A literature search found no record of its isolation from any of the zoo rodent species to which this analysis applies, but although not reported it is assumed that some of these animals may be susceptible to infection. *B. microti* is not present in Australia or New Zealand. Tick vector control in the source population and pre-export is likely to reduce the risk of incursion.

New Zealand's only endemic mammalian tick *Haemaphysalis longicornis,* is capable of transmitting *Babesia gibsoni,* so is considered a potential vector. This tick has been recorded on a wide range of species in New Zealand including the Norway rat, black rat, mice and humans.

Babesia spp are listed as unwanted notifiable organisms.

Risk management options for *Babesia* from risk assessment

- Because the small numbers of imported zoo animals are not regarded as important in the epidemiology of babesiosis, clinically healthy zoo rodent species could be imported without restrictions.

- Zoo rodents could be required to have originated from premises where babesiosis due to exotic serovars has not been confirmed by laboratory testing in any resident species in the last 3 years.

- During the PEI period the animal could be maintained tick-free to prevent new infections.

- Zoo rodents could be tested by PCR for *Babesia microti* with a selection of specific primers while in PEI. A negative result would be required to be eligible for import.

Recommendation

Zoo rodents should originate from premises where babesiosis due to exotic serovars has not been confirmed by laboratory testing in any resident species in the last 3 years, or the animals for import should be tested by PCR for *Babesia microti* with a selection of specific primers and found free from disease.

In addition, during PEI the animals should be maintained tick-free to prevent new infections.

Trypanosoma evansi (surra)

Analysis

The following points have been considered when drafting options to manage the risks associated with introduction of *Trypanosoma* in the commodity;

Capybaras have been identified as reservoir hosts of the organism in South America. Infection in capybara is often without clinical signs. Infection in other wild rodent species has not been reported. Current import standards require PEI premises to be maintained insect-free by the use of mesh screens and/or environmental insecticides.

T. *evansi* has never spread to temperate climate countries. This is probably because surra is a tropical disease and the principal vectors are *Tabanus* spp flies, which are not present in New Zealand.

Infection is chronic therefore quarantine is not an effective management option. No reliable treatment options have been developed.

Diagnosis of surra is usually based on the demonstration of the parasites in blood, supplemented by serological tests.

Risk management options for *T. evansi* from risk assessment

- To be eligible for import, zoo rodents could come from premises of origin that have not recorded cases of surra in any resident species.

- During PEI, zoo rodents could undergo direct examination of the blood by a concentration method recommended by the OIE, with no parasites observed.

- Zoo rodents could undergo direct examination of the blood by a concentration method recommended by the OIE, AND be tested for antibody by an OIE described method, with negative results within the 10 days prior to departure.

Recommendation

The animals should come from premises of origin that have not recorded cases of surra in any resident species, or be tested by an OIE-described method with negative results during PEI.

Echinococcus spp (hydatids)

Analysis

The following points have been considered when drafting options to manage the risks associated with introduction of *Echinococcus* species in the commodity;

Echinococcus spp are notifiable organisms. *Echinococcus vogeli* occurs in Central and South America where it infects bush dogs and more rarely dogs. The intermediate hosts are agouti.

The geographic distribution of *Echinococcus oligarthus* is also limited to Central and South America. It is a parasite of cougars, ocelots, jaguars and other wild felids. The intermediate hosts include the agouti and spiny rat.

In the early stages of infestation, it is unlikely that zoo rodents to be imported would exhibit any clinical signs.

Traditionally effective treatment with either praziquantel or albendazole does not seem to be reliable in zoo rodent species.

Recommendation

As zoo rodents are only potential intermediate hosts, to pass infection they would need to be eaten by a definitive host (a dog or cat). This is extremely unlikely to happen in a zoo, so the rodents pose a negligible risk in the commodity and can be imported without risk measures.

Ticks (*Ixodes, Amblyomma* spp)

Analysis

The following points have been considered when drafting options to manage the risks associated with introduction of tick species in the commodity;

All species of ticks identified on wild rodents are exotic to New Zealand. Many species are vectors of zoonotic diseases and can also cause production losses associated with parasitism of animals. Ticks have the potential to infest all mammals, birds and reptiles.

Zoo animals in general are not considered a significant pathway for the introduction of exotic ticks, mainly due to small volumes of animals imported, and reduced exposure in captivity – particularly where zoos are not situated within known tick distribution zones.

Risk management options for ticks from risk assessment

- Zoo rodents could be treated with an acaricide, 7-10 days prior to entering pre- export isolation (PEI).

- Zoo rodents could be treated during the 48 hours immediately prior to entering PEI with an insecticide/acaricide treatment regime that is effective against ticks.

- Zoo rodents could be held isolated for 30 days in PEI, with impervious washable floor and walls or on a fenced, impervious pad without walls and surrounded by a cleared area free from vegetation. Bedding should not be straw or plant material that could contain ectoparasite eggs and larvae. Inert materials such as wood shavings or sterilised peat could be considered suitable. The animals could be fed rations that are free from potential contamination with ectoparasites, their eggs, larvae or nymphs.

- Zoo rodents could have all the bedding on which they are housed removed every ten days during the PEI period and, at this time, the walls and floor could be thoroughly cleaned, and sprayed with an acaricide.

- Zoo rodents could be meticulously inspected for evidence of ectoparasites, at least 10 days after entering PEI. If still infested, the treatment could be repeated and animals inspected again at least 10 days later. Treatments and inspections could be repeated until the animals are found to be free from evidence of ectoparasites. The ectoparasiticide could be altered if the previously used treatment has not been effective.

- Zoo rodents could be treated with an acaricide within the 3 days prior to shipment.

Recommendation

These bullet point options are successive, and all (with some modification) are recommended to mitigate the risk.

To be consistent with other current IHS conditions for live animals, including zoo species, and to reduce the number of times the animals are handled, treatments should be 7-10 days prior to entry into PEI, and repeated after a thorough tick inspection at least 10 days after entry into PEI, then again if requested by MPI.

Weed Seeds

Analysis

The following points have been considered when drafting options to manage the risks associated with introduction of weed seeds in the commodity;

Weed seeds could be introduced attached to zoo rodent species' hair, within skin folds, or in their faeces.

Import risk analysis of the importation of weed species by live animals recommended that animals should be held, pre-shipment, in areas free of weed species and fed on clean pasture or high quality feed. During transport, provision of high quality feed with little or no weed species contamination or feed that has been treated in such a way as to render seeds non-viable would mitigate the risks associated with the importation of live animals. Dung produced during transport could be safely disposed of, either enroute or on arrival in New Zealand.

Risk management options for weed seeds from risk assessment

- The zoo rodents could be thoroughly groomed and inspected for contaminating plant material immediately prior to entering PEI.
- Housing the animals in PEI without environmental or food weed seeds.

Recommendation

These bullet point options are successive, and both recommended to mitigate risk. However, the examination will be done at the same time as the thorough tick inspection in PEI, as this will mean the animals only have to undergo one anaesthetic.

It is also recommended that zoo rodents are certified as being clean and free from obvious contamination with dirt, plant material and other organic matter by the official veterinarian prior to export. These measures are consistent with current IHS conditions for live animals, including zoo species.