Import risk analysis:
Cats, dogs and canine semen

REVIEW OF SUBMISSIONS

2 November 2009

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Policy and Risk
MAF Biosecurity New Zealand

Import risk analysis: Cats, dogs and canine semen

REVIEW OF SUBMISSIONS

2 November 2009

Approved for general release

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Manager, Risk Analysis
MAF Biosecurity New Zealand

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Executive Summary

MAF Biosecurity New Zealand (MAFBNZ) released the draft document *Import risk analysis*: Cats, dogs and canine semen for public consultation on 04 June 2009. The closing date for public submissions was extended from 17 July until 05 August 2009 to accommodate an extension request from Biosecurity Australia.

Based on comments made by stakeholders in response to the published draft import risk analysis, this review of submissions document makes recommendations for changes required to amend the draft document to a final risk analysis.

The next step in this process will be for the Animal Imports and Exports Section of the Border Standards Directorate of MAFBNZ to draft an import health standard alongside a document that outlines the rationale for the preferred risk management measures. These documents will then be published for a six-week period of public consultation.

As a result of comments made in two submissions received, it is recommended that the following changes be made to the draft risk analysis to make it final:

- The word ‘generally’ be inserted into the relevant sentence in Section 8.1.4. See the submission section 3, comment 3.1.3 for details.
- The following sentence be inserted into Options Section 9.3.1. ‘At the OIE General Session in May 2009, the International Committee accepted the recommendation of the TAHSC that the empty *Code* chapter on leptospirosis should be deleted from the *Code*.’
- Page 41, option 5 (2) refers to flea control options in Section 25.3. The reference should be to Section 26.3.
- Aetiological agents for babesiosis, Section 18.1.1.1.1. be amended as the un-named species of *Babesia* found in California has now been named as *B. conradae*. The tick vector for *B. canis rossi* has been redescribed and is now known as *Haemaphysalis elliptica*.
- The words ‘within New Zealand’ be inserted into the relevant sentence in Section 18.2.3. See the submission section 3, comment 3.1.12. for details.
- Page 66 and 67, Refers to tick control in ectoparasites Section 30.3, which should be Section 31.3.
- Option 3 in the babesiosis chapter (lifelong residence in a free country) be deleted.
- A paragraph and 3 supporting references be added to the leishmaniosis canine semen epidemiology section, as outlined in MAFs response Section 3, comment 3.1.16.
- In the chapter on surra, section 24.3.1, pg 98 an option for country freedom will be added.
- The word ‘natural’ be inserted into the relevant sentence page185, in regards canine influenza as per MAFs response outlined in Section 3, comment 3.1.19.
- The last measure in the canine transmissible venereal tumour chapter, pg 216, Option 5 (8 months residence in a country or region free from CTVT) be deleted.

On the 29th June 2009, canine transmissible venereal tumour was classified by a MAFBNZ Chief Technical Officer as an unwanted organism. Section 44.1.3. requires up-dating to reflect this new status.

1. Introduction

Risk analyses are carried out by MAFBNZ under section 22 of the Biosecurity Act 1993, which lays out the requirements with regard to issuing Import Health Standards (IHSs) to effectively manage the risks associated with the importation of risk goods.

Draft risk analyses are written by the Risk Analysis Group and submitted to internal, interdepartmental, and external technical review before the draft risk analysis document is released for public consultation. The Risk Analysis Group of MAFBNZ then reviews the submissions made by interested parties and produces a review of submissions document. The review of submissions identifies any matters in the draft risk analysis that need amending in the final risk analysis although the decision to implement these changes lies with an internal committee of MAFBNZ. These documents inform the development of any resulting IHS by the Border Standards Group of MAFBNZ for issuing under section 22 of the Biosecurity Act by the Director General of MAF on the recommendation of the relevant Chief Technical Officer (CTO).

Section 22(5) of the Biosecurity Act 1993 requires CTOs to have regard to the likelihood that organisms might be in the goods and the effects that these organisms are likely to have in New Zealand. Another requirement under section 22 is New Zealand's international obligations and of particular significance in this regard is *The Agreement on Sanitary & Phytosanitary Measures* (the "SPS Agreement") of the World Trade Organisation.

A key obligation under the SPS Agreement is that sanitary and phytosanitary measures must be based on scientific principles and maintained only while there is sufficient scientific evidence for their application. In practice, this means that unless MAF is using internationally agreed standards, all sanitary measures must be justified by a scientific analysis of the risks posed by the imported commodity. Therefore, risk analyses are by nature scientific documents, and they conform to an internationally recognised process that has been developed to ensure scientific objectivity and consistency.

MAFBNZ released the draft document *Import risk analysis*: Cats, dogs and canine semen for public consultation on 04 June 2009. Every step was taken to ensure that the risk analysis provided a reasoned and logical discussion, supported by references to scientific literature. The draft risk analysis was peer reviewed internally and externally and then sent for interdepartmental consultation. Relevant comments were incorporated at each stage of this review process. The closing date for public submissions on the risk analysis was 05 August 2009.

MAF received four responses to the draft risk analysis during the consultation period. Two of these were limited to general comments;

1) Ann Thompson, on behalf of Federated Farmers of New Zealand advised in an email dated 16th July advising that Federated Farmers would not be making a submission.
2) Sue Blaikie, on behalf of the New Zealand Veterinary Association's Companion Animal Society, advised by email dated 17th July that: “We have looked at the document and the comments I have received have been favourable, stating that it appears to be a very comprehensive and thorough analysis of the risks with respect to the importation of cats and dogs.”

Two formal submissions were therefore received. Table 1. lists the submitters and the organisations they represent.

This document is MAFBNZ's review of the submissions that were made by interested parties following the release of the draft risk analysis for public consultation. Public consultation on risk analyses is primarily on matters of scientific fact that affect the assessment of risk or the likely efficacy of any risk management options presented. For this reason, the review of submissions will answer issues of science surrounding likelihood, not possibility, of events occurring. Speculative comments and economic factors other than the effects directly related to a potential hazard are beyond the scope of the risk analysis and these will not be addressed in this review of submissions.

The two submissions are copied into Section 4. The review of submissions Section 3, examines the submissions received from Biosecurity Australia and Canterbury Quarantine Services Ltd.

Table 1. Submitters and Organisations Represented

Submitter	Organisation Represented
Robyn Martin	Biosecurity Australia, Department of Agriculture, Fisheries and Forestry
Chris and Lyndsey Ward	Canterbury Quarantine Services Ltd

2. Review of Submissions

2.1. ROBYN MARTIN, BIOSECURITY AUSTRALIA, DEPARTMENT OF AGRICULTURE, FISHERIES AND FORESTRY

2.1.1. Biosecurity Australia: [covering letter] 'I note that the use of certification that a country or region is free of a particular disease has been proposed as a risk management measure for a number of diseases. This may be of little protective value for diseases that are not OIE listed or notifiable in the country of origin of the dog or cat. Also, a dog's full travel history may not be known prior to export of the animals or semen.'

> ***MAFBNZ response:*** Section 3.2 of the risk analysis describes the risk management options methodology:
>
> 'For each organism classified as a hazard, a risk management step is carried out, which identifies the options available for managing the risk. Where the *Code* lists recommendations for the management of a hazard, these are described alongside options of similar, lesser or greater stringency where available. In addition to the options presented, unrestricted entry or prohibition may also be considered for all hazards. Recommendations for the appropriate sanitary measures to achieve the effective management of risks are not made in this document.'
>
> The options given are to cover a range of possible risk mitigation measures that could be used to mitigate the identified risk. Comments on the reliability of certification and the options presented for risk management will be considered by the Animal Imports and Exports Section of the Border Standards Directorate of MAFBNZ when drafting any import health standards developed from this import risk analysis.

2.1.2. Biosecurity Australia: Canine brucellosis, pg 20, Geographical occurrence:

Cases were reported from Ireland in 2009.

> ***MAFBNZ response:*** As there was no reference provided in the submission to support this statement, MAF approached the submitter and also searched the literature for relevant reports. However, no relevant information was found by either enquiry route, so no change is recommended for the risk analysis.

2.1.3. Biosecurity Australia: Canine brucellosis, pg 20, epidemiology: IRA says 'clinical signs are restricted to intact dogs and bitches' but this statement appears to be contradicted by 'neutered dogs may have mild generalised lymphadenopathy.

> ***MAFBNZ response:*** The word "generally" will be added into the final version of the risk analysis so that it reads "clinical signs are generally restricted to intact dogs and bitches".

Biosecurity Australia: Epidemiology Page 21, Neutered dogs are a lower risk for shedding of *Brucella canis*, although castrated chronically infected males may shed organisms for a long period of time.

MAFBNZ response: Noted.

2.1.4. Biosecurity Australia: A dogs' full history may not be available at the time of import or of semen collection. The likelihood of introduction is also non-negligible for dogs and semen that have been transported from endemic countries to countries where *B. canis* is not present if appropriate risk management measures are not implemented.

MAFBNZ response: The scenario suggested by Biosecurity Australia is based on an assumption that a free country would not impose adequate risk management measures to maintain freedom. In such a scenario, a claim of country disease freedom may not be made, or the importing country may not accept such a claim if made. However, comments on the suitability of the options presented for risk management will be considered by the Animal Imports and Exports Section of the Border Standards Directorate of MAFBNZ when drafting any import health standards developed from the import risk analysis.

2.1.5. Biosecurity Australia: Page 23, Option 1- testing 7 days pre-export may not allow sufficient time for further testing if necessary. Option 2- BA agrees that PCR testing on semen may be a more sensitive risk management measure for semen than testing of the live dog if an appropriate PCR is available at approved laboratories for export testing.

MAFBNZ response: The options given are to cover a range of possible risk mitigation measures that could be used to manage the identified hazard. Recommendations for the appropriate sanitary measures to achieve the effective management of risks are not made in the risk analysis or in this review of submissions. Comments on the suitability of the options presented for risk management will be considered by the Animal Imports and Exports Section of the Border Standards Directorate of MAFBNZ when drafting any import health standards developed from the import risk analysis.

2.1.6. Biosecurity Australia: Page 24 Point 9.1.2. OIE list- The OIE Terrestrial Animal Health Standards Commission (TAHSC) has deleted the chapter on leptospirosis from the *Terrestrial Animal Health Code* following the TAHSC meeting in March 2009.

MAFBNZ response: MAF acknowledges this outcome from the 77th General Session of the OIE, and it is recommended that the following be added to section 9.3.1. of the risk analysis: "At the OIE General Session in May 2009, the International Committee accepted the recommendation of the TAHSC that the empty *Code* chapter on leptospirosis should be deleted from the *Code"*.

This notwithstanding, leptospirosis remains and OIE-listed disease, so no change is necessary to section 9.1.2 of the risk analysis.

2.1.7. Biosecurity Australia: Page 28, *L. canicola* remains an important organism for exclusion because the dog is a reservoir for *L. canicola* and carriers can be life-long shedders, unlike other leptospires which may have a shorter shedding period and have reservoirs in other, often wild species. Testing with MAT panel including serogroup Canicola antigen should detect carriers.

MAFBNZ response: MAFBNZ agrees that dogs are recognised as a reservoir of *L. canicola* and that carriers can be life-long shedders. However, the MAT test has limitations when applied to imported animals due to its poor sensitivity in diagnosing both early and chronic infections, particularly when testing is carried out on a single sample. Further, the MAT cannot differentiate between current, recent or past infections or vaccination titres. Notwithstanding these limitations, the MAT is presented in the risk analysis as an option for both live animals and for semen donors. This and other options will be considered by the Animal Imports and Exports Section of the Border Standards Directorate of MAFBNZ when drafting any import health standards developed from the import risk analysis.

2.1.8. Biosecurity Australia: Page 28 Option 3. Greene et al (2006) do not cite references to support the general statement of effectiveness of aminoglycosides and doxycycline for clearing the carrier state, particularly for *L. canicola*. Antibiotics improve clinical infection, but there is no evidence to date that antibiotics achieve renal clearance in humans or dogs.

MAFBNZ response: MAF acknowledges that no antibiotic has demonstrated efficacy in *all* cases and treatment does not *guarantee* clearance of leptospires from the kidneys of carrier animals. However, should antibiotic treatment be adopted as a risk mitigation measure, Greene et al consider that doxycycline is the drug of choice for clearing the renal carrier state in dogs. Therefore this remains a valid option for risk management. The suitability of options presented for risk management will be considered by the Animal Imports and Exports Section of the Border Standards Directorate of MAFBNZ when drafting any import health standards developed from the import risk analysis.

2.1.9. Biosecurity Australia: 9.3.1.1. Semen options- Antibiotics applied directly to semen may be effective against leptospira spp.

MAFBNZ response: Acknowledged. Comments on the suitability of the options presented for risk management will be considered by the Animal Imports and Exports Section of the Border Standards Directorate of MAFBNZ when drafting any import health standards developed from this import risk analysis.

2.1.10. Biosecurity Australia: Page 41, option 5 (2) refers to flea control options in Section 25.3. The reference should be to Section 26.3.

MAFBNZ response: Acknowledged. The error will be corrected.

2.1.11. Biosecurity Australia: Page 62 Aetiological agents. A new species, *B. conradae* has been found in dogs in southern California. The tick vector for *B. canis rossi* is now known to be *Haemaphysalis elliptica*.

MAFBNZ response: Acknowledged. The aetiological agents section will be up-dated.

2.1.12. Biosecurity Australia: Page 65, [the risk analysis reads]: Babesia species of dogs and cats are not known to infect other species. Comment: Some dog and cat Babesia spp. have been found in other species and wildlife e.g. *Babesia canis rossi* was found in African wild dogs (*Lycaon pictus*) and jackels (*Canis mesomelas* and *Canis adustos*) *Theileria* (*Babesia*) *annae* was found in frozen spleens of foxes in central Spain by molecular diagnosis. *B. canis canis* was found in a horse in Spain.

MAFBNZ response: The above wording is part of the consequence assessment which discusses the potential consequences to New Zealand if this agent were introduced. The complete sentence in the risk analysis reads as follows: '*Babesia* spp. of cats and dogs are not known to infect other species, including humans.'

As there are no feral canids in New Zealand, the information provided in this submission about wild dogs and jackals is not relevant to the risk assessment. However, for clarity it is recommended that the words "within New Zealand" are added to the final risk analysis, so that the sentence will read: "*Babesia* spp. of cats and dogs are not known to be able to infect any other species within New Zealand, including humans."

The unusual finding of *B. canis canis* in a horse in Spain by PCR techniques (Criado-Fornelio et al 2003[1]) is considered to be an incidental finding that does not constitute sufficient evidence to conclude that horses are hosts for *B. canis* or that they play any role in the epidemiology of canine babesiois.

Therefore the information provided in the submission on this point does not alter the conclusions of the assessment for canine babesiosis.

2.1.13. Biosecurity Australia: Page 66 and 67, Refer to tick control in ectoparasites section 30.3. BA suggests reference should be 31.3.

MAFBNZ response: Acknowledged. The reference will be corrected.

2.1.14. Biosecurity Australia: page 67 Option 3 country freedom may be difficult to confirm.

MAFBNZ response: Acknowledged. Option 3 will be removed from the final risk analysis.

[1] Criado-Fornelio A, Martinez-Marcos, Buling-Sarana, Barba-Carretero JC (2003). Molecular studies on *Babesia*, *Theileria* and *Hepatozoon* in southern Europe Part 1. Epizootiological aspects. *Veterinary Parasitology*, 113; 189-201

2.1.15. Biosecurity Australia: pg 78 Option 1. Infestation may be clinically inapparent for 2 years or more (refer p 74).

MAFBNZ response: The options are presented in an ascending order of stringency. Under the option referred to, dogs could be certified as showing no clinical signs of heartworm on the day of shipment. The submission draws attention to the fact that animals can be subclinically infested, and it appears to suggest that this option provides inadequate protection for heartworm. Comments on the suitability of the options presented for risk management will be considered by the Animal Imports and Exports Section of the Border Standards Directorate of MAFBNZ when drafting any import health standards developed from this import risk analysis.

2.1.16. Biosecurity Australia: Leishmaniosis, pg 82 last paragraph. Preliminary research has detected *Leishmania chagasi* from semen and the reproductive tract in dogs. Reports of venereal lesions in humans are referenced by Silva et al 2008.

MAFBNZ response: Acknowledged. In view of this information, it is recommended that this section of the risk analysis will be amended to read:

"A recent experimental study (Silva et al 2009) speculates that *L. chagasi* may be sexually transmitted from naturally infected dogs to susceptible bitches in the absence of biological vectors. However, in that study the dogs used for mating the bitches had advanced signs of visceral leishmaniosis. Although these dogs were PCR positive on semen testing, indicating the presence of *Leishmania* DNA, no amastigotes could be identified in the mated bitches by either histopathology or immunohistochemistry. Therefore, the study did not prove transmission by this route. Venereal transmission has never been reported in dogs, and there is no compelling evidence to suggest that it is possible (Diniz et al 2005; Silva et al 2008)." Although extremely rare cases of veneral transmission have been reported in humans, it is not considered a sexually transmitted disease of humans."

In support of the above amendment, the following references will be added to chapter 18 of the risk analysis:

Diniz SA, Melo MS, Borges AM, Bueno BR, Reis BP, Tafuri WL, Nascimento EF, Santos RL (2005). Genital lesions associated with visceral leishmaniasis and shedding of *Leishmania* sp. in the semen of naturally infected dogs. *Veterinary Pathology* 42: 650-658.

Silva FL, Oliveria RG, Silva TMA, Xavier MN, Nascimento EF, Santos RL (2009). Venereal transmission of canine visceral leishmaniasis. *Veterinary Parasitology*, 160: 55-59.

Silva FL, Rodrigues AAM, Rego IOP, Santos RLH, Oliveira RG, Silva TMA, Xavier MN, Nascimento EF, Santos RL (2008). Genital lesions and distribution of amastigotes in bitches naturally infected with *Leishmania chagasi*. *Veterinary Parasitology*, 151: 86-90.

Notwithstanding the information provided in this submission, it is considered that the conclusions of the assessment for leishmaniosis do not require amendment.

2.1.17. Biosecurity Australia: pg 98 Options, Surra is an OIE listed disease. Country freedom may be an option.

MAFBNZ response: MAFBNZ agrees that country freedom is a feasible option for surra. It will be added to the final risk analysis and will be included in the options considered by the Animal Imports and Exports Section of the Border Standards Directorate of MAFBNZ when drafting any import health standards developed from the import risk analysis.

2.1.18. Biosecurity Australia: Fleas and ticks, page 105 and 128. Any pre-export ectoparasite treatments should be effective against both fleas and ticks and able to be administered at the same time for convenience prior to export without being unnecessarily restrictive.

MAFBNZ response: MAFBNZ agrees that treatment regimes should be effective and practical. Comments on the options and timing of treatments administered pre-export for risk management of ectoparasites will be considered by the Animal Imports and Exports Section of the Border Standards Directorate of MAFBNZ when drafting any import health standards developed from the import risk analysis.

2.1.19. Biosecurity Australia: Canine influenza H3N8, page 185, transmission to other species. In an unpublished study of experimental transmission of dog-adapted canine influenza virus to horses, horses showed clinical signs milder than those associated with equine H3N8 infection, and pathological lesions similar to EIV (Long et al 2007).

MAFBNZ response: The unpublished study could not be found and a request to the submitter was made for further information. The information provided reveals that the comment is based on a conference poster presentation that was obtained directly from Dr Paul Gibbs, a co-author. The poster has been provided and has been reproduced in Appendix 1.

The poster describes unpublished experimental studies that found horses to be susceptible to canine influenza virus infection after being artificially inoculated by nebulisation with high doses of virus. However, the resultant infection induced either no or very mild clinical disease in the horses.

There are no reported cases in the published literature of other species becoming infected by exposure to dogs with canine influenza, including humans. It is recommended that risk analysis have the word ‘natural’ inserted so as to read: “There is no evidence of natural transmission of canine influenza from dogs to other species such as humans, horses, cats or ferrets.”

However, the information provided does not alter the conclusions of the assessment for canine influenza.

2.1.20. Biosecurity Australia: Rabies, page 195. BA is currently reviewing Australian rabies conditions. Where there have been vaccination failures it appears to have been due to inadequate vaccination practices. The whole basis of the management of rabies revolves around

the effectiveness of vaccination, so if certification of vaccination status and laboratory testing results is not 100% reliable, risk management can be compromised. Reliability of certification should be assessed by evaluation of veterinary services. BA believes that it would be of great value to harmonise conditions as closely as possible between NZ and Australia because of the large numbers of dogs and cats that move back and forth between the two countries.

MAFBNZ response: Comments on the suitability of the options presented, harmonisation with Australia and evaluation of veterinary services will be considered by the Animal Imports and Exports Section of the Border Standards Directorate of MAFBNZ when drafting any import health standards developed from the import risk analysis.

2.1.21. Biosecurity Australia: Canine transmissible venereal tumour (CTVT) page 216, Options. It may be difficult for official veterinarians to certify that mating has not occurred other than by trusting an owner declaration. Country freedom may be difficult to establish.

MAFBNZ response: MAF acknowledges that there may some challenges in implementing some of the options given in the risk analysis. However, the options are intended to convey a range of possible levels of risk mitigation. MAF accepts that option 5 (8 months residence in a country or region free from CTVT) is unlikely to be practical, and it will be deleted from the final risk analysis. Stakeholder comments on the suitability of the options presented will be considered by the Animal Imports and Exports Section of the Border Standards Directorate of MAFBNZ when drafting any import health standards developed from the import risk analysis.

2.2. CHRIS AND LINDSEY WARD, CANTERBURY QUARANTINE SERVICES LTD

2.2.1. The risk analysis document does not mention the requirement for the Babesia test.

MAFBNZ response: The comment is made in regard to chapter 31, which covers ticks. The chapter on babesiosis includes an option for the further testing and treatment of dogs with ticks detected on arrival in New Zealand.

2.2.2. Also it states that the containers must be steam cleaned. We have a NZFS approved procedures manual which has a procedure for cleaning crates that have had a dog or cat with fleas or ticks. We spray the crate thoroughly with a fly spray containing Pyrethrin, leave for 24 hours and then deep clean the crate as per our procedures manual. We would therefore request that these procedures stay the same.

MAFBNZ response: The option does not use the word 'must'. It states that containers 'could' be steam cleaned before treatment with an acaricide.

The intent of the wording in the risk analysis is to ensure that the crates are thoroughly cleaned and treated. It is noted that Chris and Lindsay Ward have requested that the cleaning requirements of the crates stay as they are. Comments on the suitability of the options presented will be considered by the Animal Imports and Exports Section of the Border Standards Directorate of MAFBNZ when drafting any import health standards developed from the import risk analysis.

3. Copies of Submissions

3.1. ROBYN MARTIN, BIOSECURITY AUSTRALIA, DEPARTMENT OF AGRICULTURE, FISHERIES AND FORESTRY

Sent: Wednesday, August 5, 2009
Subject: Import Risk Analysis: cats, dogs and canine semen

Submission on Import Risk Analysis: cats, dogs and canine semen

Australian Government
Department of Agriculture, Fisheries and Forestry
Biosecurity Australia

Christine Reed
Manager, Risk Analysis
MAF Biosecurity New Zealand

New Zealand draft *Import Risk Analysis*: Cats, dogs and canine semen

Thank you for the opportunity to comment on New Zealand's draft *Import Risk Analysis*: Cats, dogs and canine semen.

Attachment 1 summarises comments and questions from Biosecurity Australia for your consideration. Please note that Biosecurity Australia (BA) is currently conducting a risk analysis on several of the disease agents, and comments are based on current knowledge and research.

I note that the use of certification that a country or region is free of a particular disease has been proposed as a risk management measure for a number of the diseases. This may be of little protective value for diseases that are not OIE listed or notifiable in the country of origin of the dog or cat. Also, a dog's full travel history may not be known prior to export of the animal or semen.

BA continues to support the close harmonisation of dog and cat conditions between NZ and Australia.

Yours sincerely

R. Mart

ROBYN MARTIN
General Manager
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Biosecurity Australia

5 August 2009

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DEPARTMENT OF AGRICULTURE, FISHERIES AND FORESTRY

Attachment 1

Biosecurity Response to MAF Biosecurity New Zealand *Import Risk Analysis*: Cats, dogs and canine semen

DISEASE/ISSUE	PAGE NO/REFERENCE	BA COMMENTS
Canine Brucellosis	20, 21 Geographical occurrence and clinical signs	Cases were reported from Ireland in 2009. IRA says 'clinical signs are restricted to intact dogs and bitches' but this statement appears to be contradicted by 'neutered dogs may have mild generalised lymphadenopathy.
	21 Epidemiology	Neutered dogs are a lower risk for shedding of *Brucella canis,* although castrated chronically infected males may shed organisms for a long period of time.
	22 Point 8.2.4 states that 'the likelihood of introduction is non-negligible for dogs and dogs' semen from countries where *B. canis* is present'.	A dogs' full history may not be available at the time of import or of semen collection. The likelihood of introduction is also non-negligible for dogs and semen that have been transported from endemic countries to countries where *B. canis* is not present if appropriate risk management measures are not implemented.
	23 Options for risk management (semen)	Option 1–Testing 7 days pre-export may not allow sufficient time for further testing if necessary. Option 2- BA agrees that PCR on semen may be a more sensitive risk management measure for semen than testing of the live dog if an appropriate PCR is available at approved laboratories for export testing.
Leptospirosis	24 Point 9.1.2 OIE List	The OIE Terrestrial Animal Health Standards Commission (TAHSC) has deleted the chapter on Leptospirosis from the Terrestrial Animal Health Code following the TAHSC meeting in March 2009.

DISEASE/ISSUE	PAGE NO/REFERENCE	BA COMMENTS
Leptospirosis cont.	28 Options 1 and 2 - Live Dogs	*L. canicola* remains an important organism for exclusion because the dog is a reservoir for *L. canicola* and carriers can be life-long shedders, unlike other leptospires which may have a shorter shedding period and have reservoirs in other, often wild, species. Testing with MAT panel including serogroup Canicola antigen should detect carriers.
	28 Option 3; Live Dogs. Treatment with antibiotics	Greene et al (2006) do not cite references to support the general statements of effectiveness of aminoglycosides and doxycycline for clearing the carrier state, particularly for *L. canicola*. Antibiotics improve clinical infection, but there is no evidence to date that antibiotics achieve renal clearance in humans or dogs.
	29 9.3.1.1 Semen - Options	Antibiotics applied directly to semen may be effective against *Leptospira* spp.
Yersinia pestis	41 Options	Option 5 (2) refers to flea control options in Section 25.3. The reference should be to Section 26.3.
***Babesia* spp**	62 Aetiological Agents	A new species, *B. conradae* has been found in dogs in southern California.[1] The tick vector for *B. canis rossi* is now known to be *Haemaphysalis elliptica.* [2]
	65 *Babesia* species of dogs and cats are not known to infect other species	Some dog and cat *Babesia* spp have been found in other species and wildlife e.g. *Babesia canis rossi* was found in African wild dogs (*Lycaon pictus*) and jackals (*Canis mesomelas* and *Canis adustos*).[3] *Theileria* (*Babesia*) *annae* was found in frozen spleens of foxes in central Spain by molecular diagnosis.[4] *B. canis canis* was found in a horse in Spain [3].

[1] Kjemtrup, AM. Wainright, K. Miller, M. Penzhorn, BL. Carreno, RA. 2006. *Babesia conradae*, sp. Nov., a small *Babesia* identified in California. *Veterinary Parasitology* **138**, 103-111

[2] Apanaskevitch, D. Horak, I. and Camicas, J-L. 2007. Redescription of *Haemaphysalis* (*Rhipistoma*) *elliptica* (Koch, 1844), an old taxon of the *Haemaphysalis* (*Rhipistoma*) *leachi* group from East and southern Africa, and of *Haemaphysalis* (*Rhipistoma*) *leachi* (Audoin, 1826) (Ixodida, Ixodidae). *Onderstepoort Journal of Veterinary Research* **74**, 181-208

DISEASE/ISSUE	PAGE NO/REFERENCE	BA COMMENTS
***Babesia* spp cont.**	67 Option 2.(2) (c) and 66 Third last paragraph	Refer to tick control in ectoparasites section 30.3. BA suggests reference should be 31.3.
	67 Option 3 (country freedom)	May be difficult to confirm.
Dirofilaria immitis	78 Option 1	Infestation may be clinically inapparent for 2 years or more (refer p 74)
Semen - Leishmaniosis	82 Last paragraph	Preliminary research has detected *Leishmania chagasi* from semen and the reproductive tract in dogs. Reports of venereal lesions in humans are referenced by Silva et al 2008.[5 6 7]
Surra	98 Options	Surra is an OIE listed disease. Country freedom may be an option.
Fleas and ticks	105 (fleas) and 128 (ticks)	Any pre-export ectoparasite treatments should be effective against both fleas and ticks and able to be administered at the same time for convenience prior to export without being unnecessarily restrictive.
Canine Influenza H3N8	185 Transmission to other species.	In an unpublished study of experimental transmission of dog-adapted canine influenza virus to horses, horses showed clinical signs milder than those associated with equine H3N8 infection, and pathological lesions similar to EIV[8]

[3] Penzhorn, BL. 2006. Babesiosis of wild carnivores and ungulates. *Veterinary Parasitology* **138**, 11-21
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[8] Long, M. Gibbs, P. Crawford, P. Castleman, W. Donis, R. Chambers, T. Beachboard, S. Dixon, M. Anderson, T.2007. Comparison of Virus Replication and Clinical Disease in Horses Infected with Equine or Canine Influenza Viruses. *Influenza Symposium. Athens, Georgia*.

DISEASE/ISSUE	PAGE NO/REFERENCE	BA COMMENTS
Rabies	195	BA is currently reviewing Australian rabies conditions. Where there have been vaccination failures it appears to have been due to inadequate vaccination practices. The whole basis of the management of rabies revolves around the effectiveness of vaccination, so if certification of vaccination status and laboratory testing results is not 100% reliable, risk management can be compromised. Reliability of certification should be assessed by evaluation of veterinary services. BA believes that it would be of great value to harmonise conditions as closely as possible between NZ & Australia because of the large numbers of dogs and cats that move back and forth between the two countries.
Canine Transmissible Venereal Tumour (CTVT)	216 Options	It may be difficult for official veterinarians to certify that mating has not occurred other than by trusting an owner declaration. Country freedom may be difficult to establish.

3.2. CHRIS AND LINDSEY WARD, OWNER OF CANTERBURY QUARANTINE SERVICES LTD

Sent: Tuesday, 23 June 2009 2:21 p.m.
Subject: Import risk analysis: Cats, dogs and canine semen

Ref: Chapter 31 Ticks 31.1.1. Option 2

At the moment we follow the following procedure taken from the Import health for importing dogs from Australia found at:

http://www.biosecurity.govt.nz/imports/animals/standards/domaniic.aus.htm which states:

9.4 If fleas or ticks are found they will be removed and the animal taken to an approved transitional facility operating to one of the following MAF Biosecurity New Zealand standards:

154.02.09 Standard for dog and cat transitional facilities

154.02.03 Standard transitional facilities for non-compliant dogs and cats

The animal will be treated for fleas/ticks and kept in the transitional facility. A biosecurity clearance will be issued, assuming the veterinary certificate is otherwise compliant, when the supervising veterinarian is satisfied that the animal and container are flea/tick-free.

In the case of a dog with ticks intercepted, the dog must be held until it has tested negative for Babesia gibsoni. The sampling for this test (PCR) must be taken at least 48 hours after the tick/s have been removed. Any bedding/toys/garments used in the transitional facility must be destroyed risk.analysis

The risk analysis document does not mention the requirement for the Babesia test.

Also it states that the containers must be steam cleaned.

We have a NZFS approved procedures manual which has a procedure for cleaning crates that have had a dog or cat with fleas or ticks.

We spray the crate thoroughly with a fly spray containing Pyrethrin, leave for 24 hours and then deep clean the crate as per our procedures manual.

We would therefore request that these procedures stay the same.

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Appendix 1

Comparison of Virus Replication and Clinical Disease in Horses Infected with Equine or Canine Influenza Viruses

M. Long[1], P. Gibbs[1], P.C. Crawford[1], W. Castleman[1], R. Donis[2], T. Chambers[3], S. Beachboard[1], M. Dixon[1], T. Anderson[1]

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Introduction

Canine influenza A subtype H3N8 virus (CIV) is a newly emerging and novel respiratory pathogen for dogs in the U.S. CIV was initially discovered as the cause of multiple respiratory disease outbreaks involving thousands of racing greyhounds at 20 tracks in 8 states from June 2004 to June 2006.[1] Since then, virus isolation and serological evidence have identified CIV infection in thousands of non-greyhound pet dogs in 25 states.[1,2]

Molecular analyses of all 8 genes of CIV isolates indicate that the entire genome of an equine influenza A subtype H3N8 virus (EIV) has been transferred from horses to dogs.[1] Subsequent virus adaptation to the dog has resulted in efficient virus replication causing clinical disease and dog-to-dog transmission.

Phylogenetic comparisons of EIV and CIV isolates based on nucleic acid sequence of the H3 gene indicate that the canine viruses are most closely related to equine virus isolates from 2003.[1] Comparisons of equine and canine viral H3 amino acid sequences have revealed that all CIV isolates analyzed to date contain 7 signature amino acid substitutions that distinguish canine from equine H3 lineages. The functional significance of these conserved substitutions to virus adaptation to the dog is unknown, but 2 are located at the HA cleavage site and the receptor binding pocket. These substitutions may be important for recognition of the HA cleavage site by canine proteases and for virus recognition of sialic acid receptors on canine epithelial cells.

It is unknown whether the highly conserved amino acid changes in CIV H3 or other viral proteins have altered ability of the virus to infect, replicate in, and cause clinical disease in the horse. The equine industry is concerned about potential reverse transmission of virus from the dog to the horse, and the ability of dog-adapted virus to cause more severe clinical disease in the horse.

Objective

To determine if CIV can infect, replicate in, and cause clinical disease in the horse similar to that caused by EIV.

Methods

Horses. Yearling horses seronegative for equine influenza virus exposure were housed in a Biosafety Level 3 containment facility for 2 weeks prior to virus inoculation for collection of baseline data on clinical parameters and for the duration of the study.

Inoculation with EIV or CIV. Five horses were inoculated with $10^{6.5}$ EID_{50} of A/equine/Ohio/2003 (H3N8) by nebulization, and 5 other horses were inoculated with $10^{6.5}$ EID_{50} of A/canine/Florida/2004 (H3N8). These inoculations were conducted separately to avoid cross-contamination by the viruses.

Monitoring for infection and disease. The horses were assessed 3 times daily for fever, cough, nasal discharge, and other clinical signs for 2 weeks postinoculation. Nasal swabs were collected daily for 10 days for virus detection by influenza A antigen capture ELISA (Directigen Flu A®). Serum samples were collected on 2 horses in each group on days 0, 7, 14, and 21 to monitor for seroconversion using hemagglutination inhibition assays specific for EIV[5] or CIV antibodies.[4]

Virus replication in tissues and histopathology. On days 3, 5, and 7 postinoculation, one horse in each group was randomly selected for euthanasia for harvesting of tissues. Trachea and lung homogenates were inoculated into eggs (EIV) or MDCK cells (CIV) for virus recovery. Formalin-fixed tissues were routinely processed for histopathology.

Table 1. Clinical signs (fever, cough, nasal discharge) in horses following inoculation with EIV (n=5) or CIV (n=5) on day 0.

	Inoculation group	
FEVER	EIV	CIV
# horses	5/5	3/5
temperature (°F)	101 - 104.7	101 - 103.1
onset (day)	1 to 2	1 to 2
duration (days)	1 to 4	1 to 2

	Inoculation group	
COUGH	EIV	CIV
# horses	5/5	0/5
onset (day)	2	NA
duration (days)	2 to 5	NA

	Inoculation group	
NASAL DISCHARGE	EIV	CIV
# horses	5/5	4/5
onset (day)	3 to 4	1 to 4
quality	mucoid	serous
duration (days)	3 to 8	1 to 3

Table 2. Virus detection on nasal swabs collected from horses inoculated with EIV or CIV using an antigen capture ELISA for influenza A nucleoprotein (Directigen®).

	Day postinoculation							
Group	0	1	2	3	4	5	6	7
EIV	0	0	3/5	3/5	3/4	4/4	3/3	3/3
CIV	0	0	4/5	5/5	2/4	3/4	2/3	1/3

Table 3. Virus recovery from trachea and lung of horses inoculated with EIV or CIV. Tissues were harvested from 1 horse in each group on days 3, 5, 7 postinoculation.

Day post inoculation	EIV recovery trachea	EIV recovery lung	Day post inoculation	CIV recovery trachea	CIV recovery lung
3	+++	+++	3	+++	++
5	+++	+++	5	—	—
7	—	++	7	+++	+

Results

Clinical disease. All 5 horses inoculated with EIV had fevers within 2 days postinoculation and duration varied from 1 to 4 days (**Table 1**). For horses inoculated with CIV, 3/5 had fevers by day 2 that lasted for 1 to 2 days. All 5 horses in the EIV group developed a cough on day 2 that persisted for 2 to 5 days. None of the horses in the CIV group developed a cough. In the EIV group, 3/5 had a mucoid nasal discharge for 3 to 8 days. In the CIV group, 4/5 had serous nasal discharge for 1 to 3 days.

Virus detection. Viral antigen (Directigen® test) was detected on nasal swabs from horses in both inoculation groups from days 2 to 7 (**Table 2**). However, more horses inoculated with EIV were shedding virus on days 5 to 7. Nasal swabs were negative for virus antigen by day 10.

Virus replication. The trachea and lung from one horse in each group was cultured for virus on days 3, 5, and 7. For the EIV group, virus was recovered from trachea on days 3 and 5, and from the lungs on days 3, 5, and 7. For the CIV group, virus was recovered from trachea on days 3 (1×10^4 PFU/g) and 7 (1×10^4 PFU/g), and from lung on days 3 (9.5×10^5 PFU/g) and 7 (3.7×10^5 PFU/g). The two remaining horses in each group seroconverted to EIV or CIV by day 14.

Histopathology. Histological examination of respiratory tissues on days 3, 5, and 7 showed that EIV and CIV induced similar pulmonary lesions consisting of diffuse bronchitis/bronchiolitis characterized by necrosis of ciliated epithelial cells, hyperplasia of non-ciliated cells, and inflammatory infiltrates.

Conclusion

Several highly conserved amino acid substitutions in the H3 protein have occurred during molecular adaptation of the virus to dogs, but CIV can still infect horses and replicate in the respiratory tract to cause pathological lesions similar to EIV. However, resultant clinical disease is very attenuated compared to that induced by EIV.

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Acknowledgments

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