



**Australian Government**  
**Biosecurity Australia**

**IMPORTATION OF ZOO BOVIDS  
FROM NEW ZEALAND**

**DRAFT POLICY REVIEW**



**November 2009**

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The picture of the antelope on the front cover was obtained from the following website:  
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## Summary

This is a policy review on the importation of zoo bovids from New Zealand. The review has drawn on the following information:

- New Zealand's import risk analysis 'Diseases of Antelope: Risks of introducing live antelope into zoological gardens' (available from the Biosecurity New Zealand website),
- current requirements for importation into Australia of sheep and goats, and semen and embryos of cattle, sheep and goats, from New Zealand,
- Australia's suspended import policies for zoo antelope from New Zealand and zoo bovidae from the United States, and
- a review of relevant scientific literature.

The policy review identifies a number of diseases of quarantine concerns and following risk assessments concludes that risk management measures are required for Johne's disease and bovine tuberculosis. It is recommended that the imported animals be certified as coming from zoos where no cases of Johne's disease or bovine tuberculosis (*Mycobacterium bovis*) have been diagnosed in the premises of origin during the past five years and that the animals for export, and susceptible in-contact animals, have been tested for *M. bovis* prior to export with negative results.

## Introduction

Biosecurity Australia is responsible for developing and reviewing quarantine policy for the import of animals and plants and their products. It does this through a science-based risk analysis process. As recommended by the World Organisation for Animal Health (OIE), a risk analysis comprises hazard identification, risk assessment, risk management and risk communication. At the completion of its process, Biosecurity Australia makes a recommendation for a policy determination to Australia's Director of Animal and Plant Quarantine. This determination is taken into account by the Australian Quarantine and Inspection Service (AQIS) when considering applications to import.

Australia's science-based risk analysis process is consistent with Australian Government policy and Australia's rights and obligations under the World Trade Organization (WTO) Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement).

Australia has a long-standing conservative approach to quarantine risk. The level of risk Australia is prepared to accept is known as Australia's appropriate level of protection (ALOP) and is expressed as providing a high level of protection aimed at reducing risk to a very low level, but not to zero.

Those risks that are very low or less meet Australia's ALOP and risk management measures are not normally required. For those quarantine risks that exceed Australia's ALOP, i.e. those risks that are greater than 'very low', risk management measures are recommended to reduce the level of risk in order to achieve the ALOP.

## Background

Quarantine requirements for the importation of zoo antelope from New Zealand and zoo bovids from the United States were adopted in 1991 and 1994 respectively. Animal Biosecurity Policy Memorandum (ABPM) 2001/03 advised stakeholders that these were suspended due to inconsistencies in risk management measures with other ruminant policies. These were subsequently suspended in 2001 as risk management measures for some diseases (e.g. Johne's disease, infectious bovine rhinotracheitis and bovine tuberculosis) were inconsistent with those in current conditions for the importation of domestic cattle, sheep and buffalo.

The Australasian Regional Association of Zoological Parks and Aquaria (ARAZPA) has requested access to several species of zoo bovids to boost declining domestic stocks. Some suitable animals are available in New Zealand and Biosecurity Australia has conducted a policy review on the importation of zoo bovids from that country.

Policies are in place for the importation of live sheep and goats, and for semen and embryos of cattle, sheep and goats from New Zealand. An access request for the importation of zoo bovids from the European Union and North America is on Biosecurity Australia's work program and some preliminary work, including identification of disease hazards, has been undertaken. The policy review is based on the existing import requirements for domestic ruminants and reproductive material, previous conditions for import of zoo bovids from New Zealand, the list of hazards identified as requiring consideration in the access requests for zoo bovids from the European Union and North America, and a review of relevant scientific literature.

The review is also based on the following risk management measures, common to most of the current import policies for zoo animals being applied:

- the animal must be resident in approved licensed or registered zoos or wildlife parks in the exporting country for at least 12 months immediately before export or since birth\*
- the premises of origin must be under veterinary supervision and have a health monitoring program
- the animal must be held in pre-export quarantine for a period of at least 30 days during which it is inspected at least daily for signs of disease, treated for internal and external parasites, and tested for diseases in accordance with recommendations arising from the policy review
- the animal must be transported to a quarantine approved premises (QAP) in Australia in a manner that ensures no direct exposure of Australian animals en route, and undergo a period of post-arrival quarantine (PAQ) in accordance with recommendations arising from the policy review
- the receiving institution must be approved under relevant Australian State or Territory legislation to hold the species being imported.

\*It is intended that Auckland, Hamilton and Wellington Zoos, and Orana Wildlife Park, be approved on completion of this review.

## Method

A disease agent of quarantine concern was given detailed consideration if it was assessed to be:

- carried by zoo bovids
- infectious
- exotic to Australia or present in Australia but subject to official control
- OIE-listed, or likely to cause significant harm if introduced into Australia.

A list of potential hazards has been compiled. It is based on the list of diseases notifiable to the OIE, and a list of other diseases identified as relevant to the importation of zoo bovids. The potential hazards identified are:

- Agents (prions) causing transmissible spongiform encephalopathies (TSEs)\*
- Alcelaphine herpesvirus-1 (wildebeest-associated malignant catarrhal fever)\*
- *Anaplasma marginale*\*
- *Babesia bovis* and *Babesia bigemina*\*
- *Bacillus anthracis* (anthrax)\*

- *Besnoitia besnoiti*\*
- Bovine herpesvirus 1 (infectious bovine rhinotracheitis)
- *Brucella abortus* (bovine brucellosis)\*
- *Brucella melitensis*\*
- Caprine arthritis and encephalitis virus
- Capripox virus\*
- *Chlamydophila abortus* (enzootic abortion of ewes)
- *Chrysomya bezziana*, *Cochliomyia hominivorax* (Old & New World screwworm fly)\*
- *Ehrlichia ruminantium* (heartwater)\*
- Foot-and-mouth disease (FMD) virus\*
- *Leptospira* spp.
- Lumpy skin disease virus\*
- Maedi-visna virus\*
- *Mycobacterium avium* subsp. *paratuberculosis* (Johne's disease)
- *Mycobacterium bovis* (bovine tuberculosis)
- *Mycobacterium tuberculosis*
- *Mycoplasma agalactiae* (contagious agalactia)\*
- *Mycoplasma capricolum* subsp. *capripneumoniae* (contagious caprine pleuropneumonia)\*
- *Mycoplasma mycoides* subsp. *mycoides* SC (contagious bovine pleuropneumonia)\*
- Ovine herpesvirus-2 (sheep-associated malignant catarrhal fever)
- *Pasteurella multocida* serotypes B2 & E2 (haemorrhagic septicaemia)\*
- Peste des petits ruminants virus\*
- Pestiviruses – bovine viral diarrhoea virus and Border disease virus
- Rabies viruses\*
- Rift Valley fever virus\*
- Rinderpest virus\*
- Vesicular stomatitis virus\*
- Wesselsbron virus.\*

New Zealand is free from most of these disease agents (Biosecurity New Zealand 2009 and OIE World Animal Health Information Database) — those marked with an asterisk in the above list — and Australia would be quickly alerted to any occurrence. They are not considered further.

The remaining hazards are:

- Bovine herpesvirus 1
- Caprine arthritis and encephalitis virus
- *Chlamydophila abortus*
- *Leptospira* spp.
- *Mycobacterium avium* subsp. *paratuberculosis*
- *Mycobacterium bovis*

- *Mycobacterium tuberculosis*
- Ovine herpesvirus 2
- Pestiviruses — bovine viral diarrhoea virus and Border disease virus.

Risk assessment is defined in the *OIE Animal Health Code* (2008a) as the ‘evaluation of the likelihood and the biological and economic consequences of entry, establishment or spread of a pathogenic agent within the territory of an importing country’. In accordance with the OIE (2008b), the ‘likelihood that a pathogenic agent will enter an importing country’, and the ‘likelihood that susceptible animals will be exposed to that agent’, are determined in this review through a ‘release assessment’ and an ‘exposure assessment’, respectively. The ‘likelihood of establishment or spread’, and the ‘biological, environmental and economic consequences of introducing a pathogenic agent’, are determined through a ‘consequence assessment’. The risk assessment for an identified agent concludes with ‘risk estimation’—the combination of the likelihood of entry and exposure and likely consequences of establishment or spread—and yields the ‘unrestricted risk estimate’.

For those risk estimates that are very low or lower meet Australia’s ALOP and no risk management measures are necessary. For those where the risk is greater than very low risk management measures are recommended to reduce the risk to a level that meets Australia’s ALOP.

## Technical background

### Bovine herpesvirus 1 (BHV-1)

Bovine herpesvirus 1 (BHV-1), an alphaherpesvirus, is a pathogen primarily of cattle. It is the causal agent of infectious bovine rhinotracheitis (IBR) and infectious pustular vulvovaginitis/balanoposthitis (IPV/IPB). Three subtypes of BHV-1 are recognised: BHV1.1, BHV1.2a and BHV1.2b. Subtype 1.2b is widespread in Australia where it causes occasional sporadic outbreaks of upper respiratory disease of varying severity. It is generally more severe and prolonged in feeder cattle.

BHV-1 is distributed worldwide although it has not been reported in a number of countries. It has been eradicated from Austria, Denmark, Finland, Sweden, Italy (Province of Belzano), Switzerland and Norway and control programs are running in some other countries (OIE Manual 2009).

BHV-1 has been isolated or antibodies detected in a number of wild species including African buffalo, eland, wildebeest, impala and others (Castro 2001; Anderson and Rowe 1998). These animals rarely show clinical signs.

Subtypes 1.1 and 1.2a are present in North America, Europe and other parts of the world, but do not appear to be present in Australia (Gu & Kirkland 2003). Viruses belonging to the 1.1 subtype are recognised as being more virulent but both 1.1 and 1.2a may cause abortion. BHV-2b strains are not recognised as a cause of foetal infection or abortion.

In New Zealand, 28 BHV-1 isolates collected from clinical samples from cattle were characterised and compared using restriction endonuclease analysis and DNA sequencing (Wang, Horner and O’Keefe 2006). Of these, 24 isolates were classified as BHV-1.2b and four as divergent strains of BHV-1.2b. The authors concluded there was no evidence that more virulent strains of BHV-1 were, or had been, present in New Zealand. New Zealand requires imported antelope (and cattle) to be negative to a serological test for BHV prior to export from their country of origin.

BHV-1.2b is present in Australia and is not subject to an official control program. There is no evidence that BHV-1 or BHV-2a are present in New Zealand. Antelope are tested for BHV with negative results prior to import into New Zealand. In these circumstances no further risk assessment is necessary – risk management measures are not warranted.

### Caprine arthritis and encephalitis virus (CAEV)

Caprine arthritis and encephalitis (CAE) is a disease of goats caused by a retrovirus. It is found in most countries of the world including Australia and New Zealand. CAE is not included on Australia's list of notifiable animal diseases. There are no mandatory control programs but voluntary control or accreditation programs are exercised in some States (Animal Health in Australia 2008).

As CAE is present in Australia and is not subject to an official control or eradication program, no further risk assessment is necessary – risk management measures are not warranted.

### *Chlamydophila abortus*

*Chlamydophila abortus* is an intracellular bacterium of the psittacosis-lymphogranuloma group (PLG) that was formerly within the *Chlamydia psittaci* taxon. It is a cause of abortion and foetal loss in sheep, cattle and goats. Infection with strains of this microorganism has also been associated with abortion and other clinical symptoms in humans. Abortion isolates from sheep have produced abortion and mastitis in cattle, and pneumonia in pigeons, turkeys and sparrows. Chlamydial isolates excreted in sheep and cattle faeces have also caused abortion in both of those species.

The first report of enzootic abortion in sheep was in Scotland in 1936. The aetiological agent was identified later (1950). Subsequently, chlamydial abortion in sheep, also known as enzootic abortion of ewes has been recognised as one of the most important causes of abortion in sheep. Chlamydial abortion in late pregnancy causes serious reproductive wastage in many sheep-rearing areas of the world, particularly where flocks are closely congregated during the parturient period.

Antibodies to viruses of the PLG have been detected in Australia (Dane and Clapp 1956) but work by these authors led them to conclude that the virus infecting sheep in South Australia was not identical with that causing enzootic abortion of ewes in the United Kingdom. Rofe (1967) reported a suspected enzootic of abortion of ewes in New South Wales in 1963 due to a PLG organism in which a 15% perinatal mortality occurred in a flock of maiden ewes. She noted that lesions in diseased foetal membranes closely resembled those described in enzootic abortion of ewes but that the organism isolated appeared to be of low virulence.

Enzootic abortion of ewes has not been reported in Australia (Animal Health in Australia, 2007), nor in New Zealand (West 2002). It is not considered further.

### *Leptospira spp.*

Leptospirosis is a contagious disease of animals and humans caused by infection with the spirochaete *Leptospira*. There are more than 200 distinct leptospiral serovars recognised and these are arranged in 23 serogroups. Leptospirosis occurs worldwide. Leptospirae live in renal tubules of carrier animals and are excreted in urine. Leptospirosis is more prevalent in the hot wet tropics than in temperate areas. A number of serovars are endemic in Australia; others are exotic or unrecorded.

In Australia, there is a low sporadic incidence in humans, cattle and pigs and occasional disease occurrences in other species. Leptospirosis in humans is a notifiable disease. The number of human cases reported annually is normally between 100 and 200, most in Queensland. Infections occur from direct exposure to urine or contaminated water. Human cases here, as in other countries, generally result from occupational exposure; most are in meat workers and farmers—banana growers, canecutters and, to a lesser extent more than a decade ago, dairy farmers.

Rodents, particularly rats, are the main reservoir hosts. Some serovars are carried by livestock. Marsupials and bats are significant carriers in some places.

Australian quarantine measures have, for many years, only been applied to dogs being imported, or from which semen is collected for importation; these are subject to testing for *L. canicola* (*L. interrogans* serovar Canicola). Dogs are recognised as the maintenance host in most countries.

Serovar Canicola is found in coastal areas of North Queensland with a few cases detected in humans and notified each year. Rainforest animals such as rats and bandicoots are the main carriers (*Leptospira* serovar fact sheet: WHO/FAO/OIE Collaborating Centre for Reference and Research on Leptospirosis).

The Code Commission of the OIE has reviewed the Terrestrial Animal Health Code (the Code) in consultation with member countries and deleted the Code chapter on leptospirosis. The rationale provided by Members—the Commission specifically notes that Australia and New Zealand provided comments—included:

‘Leptospirosis is distributed globally; it is improbable that any country can, with any credibility, claim to be free from the disease. Further, it is unlikely that any country has an official control programme for leptospirosis. Current serological tests and culture techniques are not able, with any degree of confidence, to demonstrate that an animal is free from leptospirosis. Antibiotic treatment to clear renal carriage of leptospire is not consistently successful and has not been validated in all species subject to international trade. Retention of this empty Chapter, with the words ‘under study’ gives the false impression that the OIE is able to formulate meaningful measures to manage the disease.’

Biosecurity Australia agrees that import requirements specific to leptospirosis are not warranted.

### *Mycobacterium avium* subsp. *paratuberculosis*

*M. avium* subsp. *paratuberculosis* (*MaP*) is the cause of Johne’s disease (JD), a chronic infectious enteritis of animals also known as paratuberculosis, a disease primarily of dairy cattle. It also occurs in other domestic ruminants—beef cattle, sheep and goats—and camelids, wild bovids, and deer. There are distinct cattle and sheep strains and the terms ‘bovine’ and ‘ovine’ Johnes disease are recognised. The disease features chronic loss of body condition and diarrhoea. Infection is acquired early in life but clinical signs are not normally evident for some years.

Johne’s disease is present in Australia where it is subject to voluntary control programs managed by the major livestock industries working with Animal Health Australia (AHA) and State Departments of Agriculture (see [http://www.animalhealthaustralia.com.au/programs/jd/jd\\_home.cfm](http://www.animalhealthaustralia.com.au/programs/jd/jd_home.cfm)).

Bovine Johne’s disease is most prevalent in dairy herds in Victoria and Tasmania; it also occurs in beef cattle herds in these states but at a much lower prevalence. Western Australia and the Northern Territory are considered free. A survey in Queensland dairy herds in 2008 found no evidence of infection (Animal Health in Australia 2008).

Ovine Johne’s is present in most states. Prevalence is highest in parts of South East NSW, Victoria and Tasmania. The disease also occurs in goats and alpacas. Infection of other species has been reported. These include the African antelope Jimela topi (*Damaliscus lunatus* subsp. *jimela*) and saiga antelope (*Saiga tatarica*), and a number of other non-domesticated bovids and cervids (Elizabeth S. Williams in *Infectious Diseases of Wild Mammals: Third Edition* 2001).

Johne’s disease is endemic in New Zealand dairy cattle. Importation of zoo bovids from New Zealand would probably be limited to animals from the major zoos in New Zealand — Auckland, Hamilton and Wellington Zoos. All these zoos affirm that deaths and diseases are fully investigated. Auckland and Hamilton Zoos, and Orana Wildlife Park report long-standing freedom from Johne’s disease. Disease was diagnosed in Tahr (Asian ungulates related to wild goats) and Barbary sheep (aoudads) in Wellington Zoo in 2004/5 (Geschke K: *pers comm.* 2008) but apparently eradicated by repeat testing of all hoofstock and culling of test positive animals. Testing was by faecal culture, serology and an antigen detection test.

Imported zoo bovids will be confined to zoos. The likelihood of *MaP* entering through their importation, and leading to exposure and spread of Johne’s disease to domestic bovids, is assessed

as very low. It is proposed that certification that no cases of Johne's disease have been diagnosed in the premises of origin during the past five years be required.

### *Mycobacterium bovis*

*Mycobacterium bovis*, the cause of bovine tuberculosis (BTB), was successfully eradicated from Australia as a result of the national Brucellosis and Tuberculosis Eradication Campaign (BTEC) which ran from 1970 to 1997. Freedom from bovine tuberculosis by OIE standards was achieved on 31 December 1997.

Although cattle are the main host species, *M. bovis* infects a wide range of mammal species including humans, domesticated animals, and free-living and captive wildlife. Several wildlife species are maintenance hosts. These include white-tailed deer (*Odocoileus virginianus*) and bison (*Bison bison*) in North America, brushtail possums (*Trichosuris vulpecular*) in New Zealand, badgers (*Meles meles*) in the United Kingdom and Ireland, and African buffalo (*Syncerus caffer*) in Africa.

Tuberculosis due to *M. bovis* infection has been reported in several bovid species other than cattle (*Bos* spp.) including:

- Free-living wildlife: lechwe (*Kobus leche*), water buffalo (*Bubalus bubalis*), African buffalo (*Syncerus caffer*), American bison (*Bison bison*), common or bush duiker (*Silvicapra grimmia*), wildebeest (*Connochaetes taurinus*), topi (*Damaliscus lunatus*) and lesser kudu (*Tragelaphus imberbis*), and
- Captive wildlife: bison (*Bison bison*), greater kudu (*Tragelaphus strepticerus*), Arabian oryx (*Oryx leucoryx*), eland (*Taurotragus oryx*) and bongo (*Tragelaphus eurycerus isaaci*) [Auclair et al 2002; de Lisle, Mackintosh & Bengis 2001 citing other authors; Cleaveland et al 2005].

For the purposes of this review, all bovids are regarded as susceptible to infection with *M. bovis*.

BTB has long been the major health problem in New Zealand cattle and deer herds. Control has been compromised by high levels of infection in feral brushtail possums. The possums (*Trichosurus vulpecular*), originally imported from Australia in the 1830s, have thrived in the relative absence of effective predators and have been major vectors of bovine tuberculosis.

A National Pest Management Strategy (NPMS) for bovine tuberculosis was established and approved by the New Zealand Government in 1998. The primary objective of the NPMS is to reduce the number of tuberculosis infected cattle and deer herds to a 0.2% Annual Period Prevalence rate by 2012/13. This figure is the international benchmark set by the OIE for a country to be recognised as officially free of bovine tuberculosis. The New Zealand Animal Health Board (AHB) manages and implements the NPMS. As at 30 June 2009, the herd infection rate stood at 0.35% (this equated to 131 tuberculosis infected herds made up of 121 cattle herds and 10 deer herds) compared to a forecast rate of approximately 0.6% (AHB website <http://tbfree.ahb.org.nz> accessed July 2009).

Auckland, Hamilton and Wellington Zoos report long-standing freedom from evidence of BTB. Measures are in place, including testing of imported animals and source herd history, to minimise the risk of entry. Furthermore, animals from these zoos tested for export have been negative to the tests. Autopsies are routinely carried out on animals that die and BTB has not been diagnosed. However, exposure to infected possums, although unlikely, cannot be excluded, and routine and regular testing of bovids in zoo collections is not reported.

In these circumstances, the likelihood that bovids imported from any of these zoos being infected with *M. bovis* is assessed as low. Given Australia's freedom, the consequences of an incursion would be significant and some risk management is considered warranted. It is proposed that each animal for import, and each other bovid with which it has been in contact in the previous 12

months, be tested by the single (mid-cervical or caudal fold) intradermal tuberculin test within 30 days prior to export with negative results – i.e. no visible increase in size or palpable response at the intradermal tuberculin site 72 hours after injection.

### Other mycobacteria – *M. tuberculosis*

*Mycobacterium tuberculosis* is primarily a human pathogen and the classic cause of tuberculosis in humans. Globally, there were 9.27 million new cases in 2007 and, of these, an estimated 1.37 million (15%) were HIV-positive. Seventy-nine percent of these HIV positive cases were in the African Region and 11% in the South-East Asia Region. (WHO Report 2009). Tuberculosis due to *M. tuberculosis* is also an important disease of captive non-human primates and, since 1996, has emerged as a serious disease of zoo and circus Asian elephants in the United States. It has also been found in sea lions and fur seals.

Tuberculosis due to *M. tuberculosis* in hoofstock of the Orders Artiodactyla and Perissodactyla is rare and, when it occurs, presents as a localised, non-progressive disease. There are no reports of it in Australia or New Zealand. The likelihood of importing an infected bovid from New Zealand is negligible. Risk management measures are not warranted.

### Ovine herpesvirus-2

Ovine herpesvirus-2, a gammaherpesvirus, is the causative agent of sheep-associated malignant catarrhal fever, also known as bovine malignant catarrh. Malignant catarrhal fever is an acute, generalised and usually fatal disease of some bovids and cervids. It is prevalent as a subclinical infection of sheep. The virus is present in Australia where it causes rare and sporadic clinical cases in cattle exposed to sheep. Some bovids and some cervids are more susceptible than domestic cattle; Pere David's deer and Bali cattle are extremely susceptible. Malignant catarrhal fever is not subject to official controls in Australia. No further risk assessment is necessary—risk management measures are not warranted.

### Pestiviruses – bovine viral diarrhoea virus and Border disease virus.

Bovine virus diarrhoea virus, genus *Pestivirus*, family Flaviviridae, is the cause of bovine viral diarrhoea (BVD) and mucosal disease in cattle. Classical swine fever is also caused by a pestivirus. Two biotypes of BVDV, BVD1 and BVD2, are recognised. BVD2, generally more pathogenic than BVDV1, has not been diagnosed in Australia.

Border disease virus is a related pestivirus that infects sheep. BVDV1 and border disease virus are widespread in Australia but the incidence of overt disease is low. The diseases are not subject to official controls. New Zealand has the same status.

There is serological evidence of pestivirus infection of a number of exotic bovids internationally but reports of disease in these species are lacking.

No further risk assessment is necessary – risk management measures are not warranted.

## Risk management

### *Mycobacterium avium* subsp. *paratuberculosis*

Certification of five years freedom from Johne's disease in the zoo of origin is proposed. This will be underpinned by certification attesting to veterinary programs at the zoos of origin.

### *Mycobacterium bovis*

Given the reported status of the afore-mentioned zoos, certification that no case of bovine tuberculosis has been diagnosed in the zoo of origin in the previous five years is considered appropriate risk management, and is proposed. Tests for tuberculosis in apparently healthy animals of most non-domesticated species have not been fully validated. It is also proposed that each animal for export to Australia, and all bovids that have been in contact with them in the previous 12 months, be tested during the three months prior to export by intradermal tuberculin testing (mid-cervical or caudal fold) with negative results.

## Draft quarantine requirements

### **Veterinary certification for the importation of zoo bovids from New Zealand**

1. Each animal for export to Australia has been continuously resident in a zoological garden or wildlife park licensed or registered by the New Zealand Government for the 12 months immediately prior to export or since birth. The premises of origin is under veterinary supervision and the animals held in the premises are subject to a health monitoring program.
2. No case of bovine tuberculosis (*Mycobacterium bovis*) or Johne's disease (*M. avium* subsp. *paratuberculosis*) has been diagnosed in the premises of origin during the past five years. The animal for export, and each other bovid with which it has been in contact in the previous 12 months, has been tested for bovine tuberculosis within three months prior to export by intradermal tuberculin testing (mid-cervical or caudal fold) with negative results in each case.
3. Each animal for export has been held in pre-export quarantine (PEQ) for a period of at least 30 days. During this time it has been isolated from bovids not of the same certifiable health status.
4. During PEQ, each bovid remained free from signs of infectious and contagious disease.
5. During the first week of PEQ, the animal was treated for endoparasites using parasiticides effective against nematodes, cestodes and trematodes, and tested by appropriate parasitological techniques 7 to 14 days later. The animal was re-treated if there was evidence of parasites:  
Date(s) of treatment:                      Active ingredients and dose rate:
6. During PEQ, the animal was treated twice at an interval of 14 days for ectoparasites using parasiticides effective against mites and lice.  
Dates of treatment:                      Active ingredients and dose rate:
7. The animal was examined by an Official Veterinarian within 24 hours prior to leaving the PEQ premises for the port of export and was found to be free from signs of communicable disease, free from external parasites and fit to travel.
8. The container for the transport of the animal to the port of export was new or was cleaned and disinfected to the satisfaction of the Official Veterinarian prior to loading the animal.
9. During transport to the port of export the animal had no contact with animals except those of the same export consignment and with the same certified health status.

10. So far as can be determined, the preparations for transport, and the container in which the animal is carried, are of a standard not less than those required by the International Air Transport Association (IATA) Live Animals Regulations.

### **Transport**

The animal must be consigned to Australia by a route approved by the Australian Quarantine and Inspection Service (AQIS). It may be accompanied by other animals only with the approval of AQIS. Any transshipment requires the approval of AQIS. Stops on route will need approval from relevant authorities in the countries of transit and transshipment.

### **Post-arrival quarantine measures**

1. Each imported animal must undergo post-arrival quarantine (PAQ) in a quarantine approved premises (QAP) for 14 days.

2. During PAQ, the animal may be subject to testing and/or treatment for disease or parasites. If any animal fails a test or shows signs of disease or does not meet these requirements, that animal and any other animal in the QAP may be:

- detained in quarantine for further testing and observation
- exported at the importer's expense
- destroyed without recompense.

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