

## **Risk Assessment Bovine Brucellosis in Australia**

### **Introduction**

This report evaluates the status of bovine brucellosis (*Brucella abortus*) in Australia. The report is in response to a request from Australia for recognition as free of bovine brucellosis. Information and data for the report were obtained from the Government of Australia. The report was prepared by Drs. Lynn Miller and Richard Fite, APHIS-PPD-RAS, March, 1999.

This report focuses on the eleven risk factors identified in the Policy Statement accompanying APHIS's Regionalization Final Rule. Those factors are:

- Authority, organization, and infrastructure of veterinary services;
- Disease surveillance;
- Diagnostic laboratory capabilities;
- Disease outbreak history and disease prevalence;
- Active disease control programs, if any;
- Vaccination status;
- Disease prevalence and outbreak history in adjacent regions;
- Separation of the region from regions of higher risk through physical or other barriers;
- Control of movements of animals and animal products from regions of higher risk;
- Livestock demographics and marketing practices; and
- Animal health policies and infrastructures for animal disease control.

### **Risk Factors for *Brucella abortus* in Australia**

#### *Authority, organization, and infrastructure of veterinary services*

Australian States and Territories are responsible for disease control and eradication within their own boundaries. The commonwealth provides advice and coordination, and in some circumstances, financial assistance for national disease eradication programs. Each State/Territory is subdivided into veterinary regions or divisions under the control of a government veterinary officer. Each region or division is further subdivided into either animal health districts or rural lands protection boards which are administered by inspectors who may be veterinarians or qualified animal health technicians. Australia has approximately 540 professionally qualified veterinarians employed by Commonwealth and State/Territorial governments (8% of the 6700 veterinarians in the country). Government veterinarians are supported by 4400 animal health technicians. An additional 5230 veterinarians (78%) are in private practice and are required to report any suspected cases of bovine brucellosis (1). The National Bovine Brucellosis and Tuberculosis Eradication Campaign (BTEC) was established in 1970, and continues as a collaborative effort funded by the Australian cattle

industry, the Commonwealth Government, and the State/Territory governments. The Standard Definitions and Rules (SD&R) in BTEC outline the actions, authority, and responsibility of the Chief Veterinary Officer of each State/Territory, and act as guidelines to formulate detailed operating procedures in response to any suspected case of brucellosis (5).

Evaluation: APHIS believes Australia has adequate legal authority, organization, and veterinary infrastructure to recognize and respond appropriately, including notification of international bodies and foreign governments, to outbreaks of bovine brucellosis if they were to occur.

#### *Disease surveillance*

Brucellosis was last diagnosed in Australia in 1990. Serologic testing at abattoirs and milk ring testing of dairies was continued until 1993, with no additional cases identified.

Currently, brucellosis surveillance depends on investigation of unexplained bovine abortions and reported cases of human brucellosis. Serologic testing is used to monitor export cattle. From January 1 to March 31, 1998, 79 abortion investigations were performed, all negative for brucellosis. During 1997, 14,057 cattle were tested for brucellosis for a variety of reasons, all with negative results (5). Queensland, the last state to eradicate brucellosis, recently completed two structured surveillance programs for brucellosis, with negative results.

Evaluation: APHIS finds Australia's surveillance adequate to detect outbreaks of brucellosis if they were to occur. Australia continued active disease surveillance for four years after the OIE declared Australia free of bovine brucellosis. That surveillance was sufficient to detect two additional cases of brucellosis (one in September, 1989 and the second in 1990). That same level of surveillance continued through 1993, with no further disease detected.

#### *Diagnostic laboratory capabilities*

State Veterinary Laboratories offer diagnostic serology at a number of sites. State/Territory laboratories require either minimum qualifications, a tertiary diploma, or bachelors degree for scientific supervisory personnel. All diagnostic work is under scientific supervision. The Australian National Quality Assurance Program (ANQAP) conducts annual quality assurance testing for veterinary diagnostic procedures in Australia and New Zealand. Laboratories were evaluated on their ability to accurately report results for the Complement Fixation Test (CFT), Rose Bengal Plate Test (RBPT), and Serum Agglutination Test (SAT) (8). Other laboratories also offer the ELISA and Milk Ring Test. In addition to State/Territory laboratories, the Australian Animal Health Laboratory (AAHL) is the Australian Brucella Reference lab, with responsibility for identification and typing of any Brucella organism isolated and identified at State/Territory laboratories.

Evaluation: APHIS believes Australia's diagnostic laboratories are accurate and reliable. They should be able to diagnose bovine brucellosis if it were to occur.

### *Disease outbreak history and disease prevalence*

Australia initially began localized programs to control brucellosis in the late 1940\_s. By 1970, the Commonwealth, States/Territories, and cattle industry jointly formed the BTEC, a program designed to eradicate bovine tuberculosis and brucellosis. As applied to brucellosis, the program identified infected herds through herd testing, slaughter surveillance, traceback and epidemiological investigation of at-risk herds, and milk ring testing of dairies. Brucellosis eradication tools included test and slaughter programs, quarantines on infected herds, and vaccination programs for both heifers and adults. No outbreaks of brucellosis have been detected since 1990. Australia satisfied requirements set by the Office of International Epizootics (OIE) to be declared free of bovine brucellosis in 1989 (4).

Evaluation: APHIS believes that the absence of reported outbreaks of bovine brucellosis since 1990 is compelling evidence that the disease in fact does not exist in Australia.

### *Active disease control programs, if any*

No active disease programs currently exist. Emergency disease response plans exist for brucellosis, as for other exotic diseases.

Evaluation: Given the absence of reported outbreaks of brucellosis for nearly ten years, APHIS believes that active disease control programs are not necessary in Australia.

### *Vaccination status*

The use of vaccine for prevention of bovine brucellosis officially ended on 30 June 1985. No bovine brucellosis vaccine is used, manufactured, or imported into Australia.

Evaluation: APHIS believes that brucellosis vaccination is unnecessary and inappropriate in Australia. The absence of vaccination for nearly 15 years is sufficient to ensure that Australian cattle should be entirely seronegative.

### *Disease prevalence and outbreak history in adjacent regions*

Australia has no contiguous adjacent regions. The closest noncontiguous land mass is Papua New Guinea, which is separated from Australia by the 120 kilometer wide Torres Straits. Papua New Guinea declared freedom from bovine brucellosis during the 1970\_s, and abattoir surveillance since then has confirmed continued freedom from the disease. Indonesia, the next nearest neighbor, is considered infected. Importation of cattle from either of these countries into Australia is not permitted, and the risk of illegal animal movement is very low, given the long distances of open water between Australia and other countries and regions. New Zealand, 2500 km distant, is free of bovine brucellosis.

Evaluation: APHIS believes that adjacent regions pose little risk for the introduction of bovine brucellosis.

*Separation of the region from regions of higher risk through physical or other barriers*

Australia is an island nation, completely separated from all other regions by ocean on all sides. The closest land mass, Papua New Guinea, is 120 kilometers distant.

Evaluation: APHIS believes that sufficient physical barriers exist to effectively isolate Australia from any areas of higher risk.

*Control of movements of animals and animal products from regions of higher risk*

Australia imports cattle from the United States, the European Union, New Zealand, Republic of South Africa, Canada, Switzerland, and Norway. Quarantine regulations require that imported cattle come from a herd and/or region recognized free of brucellosis by OIE. In addition, Australia requires that imported cattle must also test negative on a complement fixation test 30 days prior to import, and again 30 days after import.

Evaluation: APHIS believes that Australia has sufficiently restrictive import requirements to ensure that imported animals and animal products are unlikely to reintroduce bovine brucellosis.  
*Livestock demographics and marketing practices*

Australia requires that every cattle herd in the country be identified by a unique tailtag. There are approximately 145,000 cattle herds in Australia. Some commercial enterprises may have more than one herd on a property. The Australian Bureau of Agriculture and Resource Economics (ABARE) had identified 44,600 enterprises with cattle whose agricultural operations are valued at over AU\$22,500. The 1997 census for cattle in Australia is summarized in the table below:

**Table 1: Cattle Numbers (x 1,000) by Type and State/Territory, 1997**

	<i>NSW</i>	<i>Vic</i>	<i>Qld</i>	<i>SA</i>	<i>WA</i>	<i>Tas</i>	<i>NT</i>	<i>ACT</i>	<i>Aus</i>
<i>Beef</i>	6,038	2,519	10,071	1,049	1,859	536	1,204	11	23,287
<i>Dairy</i>	397	1,849	302	164	128	226	1	0	3,057
<i>Total</i>	6,425	4,368	10,373	1,213	1,987	762	1,205	11	26,344

The majority of cattle in Australia are beef cattle, with the largest populations in Queensland (40%) and New South Wales (24%), which together account for more than 2/3 of all the cattle in Australia. Livestock markets are situated in major rural towns and adjacent to capital cities within each region. Cattle presented to slaughter markets or abattoirs are required to be identified to the herd of origin by certified tailtag registered with the veterinary authorities in each state.

Evaluation: APHIS believes that Australia has an adequate system for identifying cattle and cattle herds.

*Animal health policies and infrastructure for animal disease control in the region*

Policies and infrastructure used in the eradication of bovine brucellosis remain in place. Procedures used included test and slaughter, epidemiological investigations and tracebacks, compensation for depopulated herds, and quarantine of suspect or affected herds. Vaccination, used during eradication, would not be used during an exotic disease outbreak.

Evaluation: APHIS believes that if bovine brucellosis were reintroduced, Australia has sufficient animal health policies and infrastructure to respond adequately.

**Qualitative Risk Characterization**

Based on the evidence presented above, APHIS finds that:

1. Australia has sufficient legal authority, organization, and veterinary infrastructure to respond adequately to outbreaks of bovine brucellosis;
2. Australia has adequate surveillance to detect brucellosis if it were present;
3. Australia has adequate laboratory capability to diagnose brucellosis;
4. Australia has had no reported outbreaks of brucellosis since 1990;
5. Australia is competent to implement active brucellosis control program if necessary;
6. Australia has not vaccinated cattle for nearly fifteen years, thus ensuring an entirely seronegative national cattle herd;
7. Australia has no adjacent regions or countries in which brucellosis is known to exist;
8. Australia has physical or other barriers providing adequate separation from regions and countries where brucellosis is known to exist;

9. Australia has adequate import restrictions to control movement of animals and animal products from regions or countries in which brucellosis is known to exist;
10. Australia has an adequate system for identifying cattle and cattle herds; and
11. Australia has adequate policies and infrastructure for controlling and preventing brucellosis.

APHIS believes that the absence of reported outbreaks of bovine brucellosis for nearly ten years combined with a strong and capable veterinary infrastructure, reliable diagnostic capacity, active surveillance, and adequate legal authority provides compelling evidence that bovine brucellosis has not been present in Australia. APHIS finds no reason to believe that Australia's declaration of freedom from bovine brucellosis, or the OIE's recognition, were incorrect.

APHIS finds the evidence sufficient to conclude with a high level of confidence that bovine brucellosis does not currently exist in Australia and has not been present in that country for nearly ten years. APHIS also believes that the probability of inadvertent reintroduction is low. APHIS concludes that the probability that animals and animal products imported into the United States from Australia would introduce bovine brucellosis into the U.S. is negligibly and acceptably low.

## **References**

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6. Australian Standard Diagnostic Techniques for Animal Diseases: Bovine Brucellosis: Bacteriology. L.A. Corner and G.G. Alton, & Australian Standard Diagnostic Techniques for Animal Diseases: Bovine Brucellosis: Serology. L.A. Corner.
7. Animal Health Surveillance Quarterly: Newsletter of Australia's National Animal Health Information System. Vol 3, Issue 1; 1 January to 31 March, 1998.
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9. Australian Animal Health Laboratory: \_CSIRO Animal Health\_ and \_Why AAHL?\_