

# NATIONAL JOHNE'S DISEASE CONTROL PROGRAM

## Quarterly National Coordinators' Report

**April - June 2002**

Prepared  
by  
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For more information and lists of assessed MAP herds and flocks  
see the Johne's Information Centre website:

<http://www.aahc.com.au/jd/index.htm>

## **THE NATIONAL JOHNE'S DISEASE PROGRAM**

Highlights of the second quarter of 2002:

- The proposed national approach to bovine Johne's disease Program (NBJDP) plan was circulated for comment to a wide range of stakeholders.
- A review of zoning for BJD for the Cattle Council of Australia recommended greater use of risk based vendor declaration based for cattle movements.
- The second edition of the GoatMAP was published and circulated to people involved in the program.
- Analysis of the performance of the ELISA test in Victorian BJD control program herds indicated that it was only detecting a small proportion of infected cattle.
- National Industry informed the Program Advisory Committee that the planned national financial assistance package for the NOJDP would not be delivered.
- The OJD vaccine Gudair (CSL) was registered and launches held to inform producers about its use.
- VetCom endorsed zone boundaries to enable the introduction of OJD Protected zones.
- Over twenty delegates from Australia attended the 7<sup>th</sup> International Colloquium on Paratuberculosis in Bilbao, Spain.

## CATTLE

### National BJD Program Review of Zoning

The Cattle Council of Australia sponsored a discussion paper on the role of zoning in the control of Johne's disease in cattle and particularly in beef cattle. The review recommended greater use of vendor declaration based on risk assessment.

Zoning for BJD reflects the distribution of the infection primarily in dairy cattle. The prevalence of known infected beef herds is very low by comparison. Testing in breeding herds for CattleMAP and to meet certification requirements for interzone trading (eg Check testing) has added weight to the argument that movement restrictions on beef herds should be eased.

Successful assessment of the risk that a herd may or may not be infected and that cattle moved from the herd may infect other herds requires a practical approach that can be understood and implemented voluntarily by owners, agents and other advisers. These are being developed as part of the national approach to BJD.

### Disease Sitrep

The National Animal Health Information System (NAHIS) reported the numbers of officially known infected cattle herds at the end of June 2002. These are compared in Table 1 to those reported at the end of the previous two fiscal years.

Table 1. Infected cattle herds for 2000 – 2002 (NAHIS).

<i>State</i>	<i>June 02</i>	<i>June 01</i>	<i>June 00</i>
<i>NSW</i>	<i>146</i>	<i>132</i>	<i>142</i>
<i>VIC</i>	<i>1154</i>	<i>1164</i>	<i>1915</i>
<i>TAS</i>	<i>16</i>	<i>15</i>	<i>40</i>
<i>SA</i>	<i>44</i>	<i>37</i>	<i>36</i>
<i>NT</i>	<i>2</i>	<i>0</i>	<i>0</i>
<i>Qld</i>	<i>1</i>	<i>2</i>	<i>2</i>
<i>Total</i>	<i>1363</i>	<i>1350</i>	<i>2134</i>

No infected cattle herds were reported in Western Australia.

In the Northern Territory, infection has been found in cattle dispersed from a dairy herd that was previously known to be infected. Intensive tracing and investigations are being undertaken to protect the Territory's protected zone status.

### Market Assurance

The total number of CattleMAP assessed herds increased by 9 herds to 1600 during the quarter. The distributions of assessed herds by State and status are shown in Table 3.

Table 2. Numbers of assessed herds in CattleMAP, June 2002.

	<b>MN1</b>	<b>MN2</b>	<b>MN3</b>	<b>Sub-total</b>
NSW	282	348	308	<b>938</b>
VIC	268	37	6	<b>311</b>
SA	165	67	5	<b>237</b>
TAS	86	28	0	<b>114</b>
QLD	0	0	0	<b>0</b>
	801	480	319	<b>1600</b>

Thirty-nine herds withdrew from the program or were disbanded during the quarter.

### Review of ELISA performance

Following an independent review of the sensitivity of the absorbed ELISA for BJD in 2000, it had been agreed that the overall sensitivity of the tests as used in Australia was approximately 30%.

Recently analyses of the results of the Victorian Test and Control Program (TCP) has indicated to the program coordinators that the ELISA was not detecting the proportion of infected animals early in herd testing that should have been detected if the ELISA was performing at a sensitivity of 30%. This was indicated by the slow rate of decline in the proportion of reactors at tests over time and the age distribution of animals at the time of reacting.

In the absence of a suitable gold standard by which to classify animals, models were

developed to estimate how the ELISA was performing. These have indicated that the average sensitivity of the ELISA over all age groups at the first herd test was probably between 10 and 15% and that sensitivity remained reasonably constant after animals reached 5 years of age, at approx. 20%.

Veterinary Committee has established a working group to review the performance of the ELISA and to report on the implications of these findings for surveillance, assurance and control of JD in cattle.

## Cross-infections between sheep and cattle

### Summary of reported cases

The premise that cattle and sheep subtypes only rarely infect sheep and cattle respectively in Australia has been a cornerstone for JD control programs in this country since the 1980's. This has been based on

- Observation that there were rarely infected sheep and cattle on the same property,
- Cultural differences between the readily cultured types from cattle and the types which cause OJD, which has not been routinely cultured until the late 1990's.
- Genetic (DNA) differences between the two types.

In 1998, DNA consistent with S types of *M paratuberculosis* was identified in stored tissue sections from a small number of suspected cases of JD in cattle from 5 properties. These cattle had been negative on culture at the time of the initial investigations. They had occurred since 1989 in areas where OJD had become endemic, and involved five cattle. Cattle had originally become infected on three properties. Secondary properties were involved as they each introduced an infected bull from the first three properties.

From time to time other cases of cross-infection have been detected in Australia. A recent review of State records found that cross-infections have been reported to have occurred on 21 primary properties since 1989, with 15 of these being isolations of C type *M paratuberculosis* from sheep.

Most of the cross-infections detected appear to involve a small number of animals and have been contracted directly from the "host species", but on a few properties larger numbers of infected animals have been detected. At this stage, it is not clear whether or not the cross-infected type has spread among the "recipient species".

### Research into transfer of S types to Cattle

A research project investigating the incidence of infection in cattle grazing with OJD infected sheep has been completed. Twelve properties are involved in the study and over 1,900 blood samples and over 1,700 dung samples have been collected from cattle that have grazed with OJD infected sheep. No infection was found in any cattle on these farms.

The summary of known cases and the research project have confirmed that cross-infections between cattle and sheep are occurring but uncommonly. It appears that sheep are more susceptible to infection with C types compared to the risks of cattle contracting S types.

Shared grazing between sheep and cattle is still considered a low risk for disease transmission and national and State policies have not been changed at this time. However, to further reduce the risk of infection, young animals should not be grazed in paddocks that may be heavily contaminated by another species. This would be especially important to studs and breeders of commercial replacement animals.

## SHEEP

### Surveillance

At 30 June, 2002, 931 flocks were classified as Infected. A total of ninety three (93) newly detected infected flocks were reported during the quarter in NSW (79), Victoria (8), South Australia (4) and Tasmania (2). Of the 79 NSW flocks, 35 were in the Residual zone. There have been a total of 1,373 flocks (1.6% of Australian flocks) detected as Infected since 1980.

A further 4,463 flocks (5.4 % of Australian flocks) are under investigation as either Suspect

or Under Surveillance flocks. This figure has increased by 198 flocks during the quarter (5%), due primarily to increases in the number of flocks classified as Under Surveillance in the Control zone in New South Wales).

Abattoir surveillance continued to be the main activity during this quarter, with a total of 4,883 lines, comprising 1.4 million sheep, being screened. This is slightly lower than last quarter's figures (down 14%). It brings the total screened via abattoir surveillance to approximately 52,000 lines comprising an estimated 15 million sheep since 1 October 1999.

Abattoir surveillance activity continued to focus on low risk zones, with 94% of lines screened originating from Control or Free zones and 6% from Residual zones.

Infected lines were detected in flocks reported as originating from NSW (239), and Victoria (27), and an additional line was detected in South Australia from a known infected flock. The rate of detection for lines originating from Residual zones was 41%, and 3% for lines originating from Control zones.

Further details can be found in the NOJDP Quarterly Surveillance Report No. 13a (see <http://www.aahc.com.au/jd>)

Table 3. Current infected sheep flocks for 2000 – 2002 (NOJDP).

<i>State</i>	<i>June 02</i>	<i>June 01</i>	<i>June 00</i>
<i>NSW</i>	840	584	453
<i>ACT</i>	1	2	2
<i>VIC</i>	45	21	19
<i>TAS</i>	30	20	18
<i>SA</i>	15	19	22
<i>WA</i>	0	0	1
<i>Qld</i>	0	0	0
<i>Total</i>	931	646	515

## National Program Developments

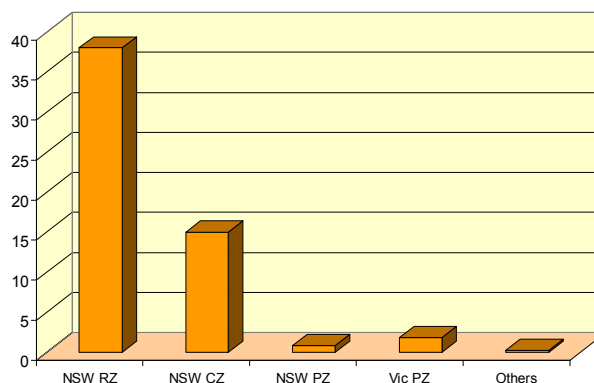
A number of developments within the NOJDP have resulted in the Program Advisory Committee developing a Revised Two Year "Transition" Plan to complete the NOJDP. These developments include the increased

knowledge on the distribution of disease, and the inability to broker a national assistance package. The Board of Animal Health Australia and the parties to the NOJDP are still to consider the "Transition" Plan.

## Protected Zone Status

During the quarter States submitted their applications to Veterinary Committee for Protected Zone status. Areas expected to be declared Protected include Queensland, western and northern NSW, Victoria, Tasmania (excluding Flinders Island), and mainland South Australia. In addition, a portion of Kangaroo Island (the Dudley Peninsular) has since been proposed by South Australia for Protected status, with the remainder of Kangaroo Island being a Control status.

Below is a graph of the expected prevalence of OJD in the proposed new zones which are proposed to be introduced on 1<sup>st</sup> October 2002.



## Vaccine Developments

The registration of the imported Spanish vaccine Gudair (CSL) during the quarter has resulted in considerable activity. CSL conducted a series of "launch" meetings, and additional information days have also been held, primarily in NSW. Changes to the Standard Definitions and Rules (SDRs) have enabled the potential widespread use of vaccine in the Residual Zone, and also to a lesser extent in the Control zone. An assurance status known as MAV – Market Assured Vaccinating has been approved, although recent developments will mean this approach will be incorporated in the SheepMAP.

Producers who use vaccine in the Residual zone will have increased trading options, with the changes to the SDRs allowing considerable trading within the Residual and Control zones for approved vaccinated stock.

## Market Assurance

The nett increase of 11 flocks (to 785) this quarter continues the slow growth in the number of assessed flocks in the SheepMAP.

Table 4. Numbers of SheepMAP assessed flocks, June 2002.

	<b>MN1</b>	<b>MN2</b>	<b>MN3</b>	<b>Sub-total</b>
NSW	212	140	15	<b>367</b>
VIC	99	43	5	<b>147</b>
SA	140	77	7	<b>224</b>
TAS?	16	21	0	<b>37</b>
QLD	4	6	0	<b>10</b>
	471	287	27	<b>785</b>

One MN1 flock and another MN2 flock were found to be infected in Victoria, both at Maintenance Tests. The sources of infection have yet to be identified.

## GOATS

Table 5. Numbers of infected goat herds for the period 2000 – 2002 (NAHIS).

<i>State</i>	<i>June02</i>	<i>June 01</i>	<i>June 00</i>
<i>NSW</i>	12	3	9
<i>VIC</i>	8	11	16
<i>TAS</i>	5	3	9
<i>SA</i>	0	0	0
<i>WA</i>	0	1	1
<i>Total</i>	25	18	35

## GoatMAP

The number of assessed herds in the GoatMAP increased by 14 during the quarter.

Table 6. Numbers of assessed herds in GoatMAP, June 2002.

	<b>MN1</b>	<b>MN2</b>	<b>MN3</b>	<b>Sub-total</b>
NSW	45	15	0	<b>60</b>
VIC	5	1	0	<b>6</b>
SA	13	0	0	<b>13</b>
TAS	2	0	0	<b>2</b>
QLD	0	0	0	<b>0</b>
	65	16	0	<b>81</b>

An issue that has concerned some goat owners in the MAP is the requirement for post-mortem examination of a small number of “thin goats” at the annual veterinary audit. The purpose of this section is to investigate animals that may be showing signs suggestive of Johne’s disease. Approved veterinarians must inspect the herd and may decide to post-mortem and submit samples from up to three such animals if they consider them abnormally thin, taking into consideration the condition of the herd or mob and their nutritional and physiological status. If less than 3 suitable animals are examined at post-mortem, this is recorded as part of the annual audit.

## CAMELIDS

NAHIS reported the following numbers of known infected alpaca herds at the end of June 2002 and for the previous two fiscal years (Table 7).

Table 7. Numbers of infected alpaca herds for the period 2000 – 2002 (NAHIS).

<i>State</i>	<i>June 02</i>	<i>June 01</i>	<i>June 00</i>
<i>NSW</i>	1	0	1
<i>VIC</i>	4	6	9
<i>TAS</i>	0	0	0
<i>SA</i>	0	0	0
<i>Total</i>	5	6	10

## AlpacaMAP

The number of herds with assessed status in the AlpacaMAP fell by 12 during the period.

Table 8. Numbers of assessed herds in AlpacaMAP, March 2002.

	<b>MN1</b>	<b>MN2</b>	<b>MN3</b>	<b>Sub-total</b>
NSW	41	66	10	<b>117</b>
VIC	13	21	4	<b>38</b>
SA	5	23	8	<b>36</b>
TAS	0	0	0	<b>0</b>
QLD	0	0	0	<b>0</b>
	59	110	22	<b>191</b>

## DEER

### Disease Sitrep

Table 9. Numbers of infected deer herds at June 2002 and at March and June 2001 (NAHIS).

<i>State</i>	<i>June 02</i>	<i>Jun 01</i>	<i>Mar 01</i>
<i>NSW</i>	<i>0</i>	<i>0</i>	<i>0</i>
<i>VIC</i>	<i>7</i>	<i>4</i>	<i>4</i>
<i>TAS</i>	<i>0</i>	<i>0</i>	<i>0</i>
<i>SA</i>	<i>1</i>	<i>1</i>	<i>0</i>
<i>QLD</i>	<i>1</i>	<i>0</i>	<i>0</i>
<i>Total</i>	<i>9</i>	<i>5</i>	<i>4</i>

## RESEARCH

Peter Rolfe, MLA's Research Coordinator, has provided the following quarterly update on developments on R&D research:

### New OJD Research Projects

Since Spring 2001 the following projects have started:

- Transmission of infection from ewes to lambs.
- Definition of mortalities due to OJD in infected flocks.
- Effect of sheep age and the level of pasture contamination on the onset and progression

of OJD.

- Influence of soil characteristics and nutrition on Johne's Disease in sheep and cattle (review).
- Development of computer models to predict the spread of OJD within, and between, flocks and regions.
- Validation of a gamma interferon test for early detection of OJD.
- Assessment of inspection of individual intestinal tracts at abattoirs.
- Comparison of currently available diagnostic tests over time including intestinal biopsy and culture.

Update of significant results:

### Comparison of PFC and AGID to detect OJD infections

A recently completed project compared the ability of each test to detect OJD infected flocks under a range of scenarios. The study revealed that PFC is more sensitive at detecting infection than AGID when the same numbers of sheep are sampled, particularly in flocks that have been recently infected and those with a low prevalence of the disease. Greater numbers of sheep must now be tested if AGID is used for flock screening compared to PFC. PFC is also able to detect infection at an earlier stage than current blood tests.

### Abattoir surveillance

A new research study will compare the ability of experienced meat inspectors to detect visible signs of OJD in sheep at varying stages in the disease progression and from flocks with varying numbers of infected sheep.

### Individual animal tests

A new project evaluating testing strategies for individual sheep at different stages of the disease has commenced. Lambs grazing OJD contaminated paddocks are examined at regular intervals using a range of different tests. The tests under evaluation include various blood tests, including the new gamma interferon test, and dung tests, including the new direct PCR test, which detects fragments of DNA from the OJD organism. Biopsy samples of intestines and lymph nodes are also being collected surgically for microscopic examination and to be cultured for the OJD bacteria. Two tissue culture methods will be compared to determine

the most sensitive technique. The results of this study should allow recommendations to be made about the real value of each test.

### **Gamma interferon test**

Field trials are underway to establish the diagnostic accuracy of this test in both unexposed and infected sheep flocks before it can be considered for endorsement and adoption as an official diagnostic test. Early results indicate that the specificity of the test is high in flocks that have not been exposed to infection but is lower in flocks that have had some exposure. The sensitivity is higher than other tests examined so far.

### **Risk factors for the development of OJD**

A new proposal to assess risk factors that lead to the progression of the disease on infected farms is currently under evaluation. These risks include management, animal and environmental factors.

### **Vaccination**

A lamb vaccination trial is underway on three heavily infected properties in NSW. Results to date indicate that vaccination has delayed faecal shedding of OJD bacteria for approximately 12 months in one flock and for 18 months in the other two flocks. Unvaccinated control lambs began shedding from 6-8 months of age. Delayed shedding should reduce pasture contamination and provide less opportunity for disease transmission. Deaths due to OJD commenced in unvaccinated sheep on all three properties by 16 months of age. In contrast only two vaccinated sheep has died from OJD to date.

Initially up to 50% of vaccinated lambs developed injection site reactions. At 18-24 months after vaccination the number of animals with a palpable lump has decreased to between 20-30%. The extent of additional trimming at slaughter will not be known until the animals are slaughtered at the end of the study.

A further study is now planned to assess the effectiveness of vaccination in flocks with a lower prevalence of the disease and therefore lower mortality rates and lower levels of bacterial contamination in the environment.

### **Assessing the Spread of OJD within and between Flocks**

A new project has developed computer simulation models of OJD spread both within flocks and within geographical areas. It is hoped that these computer models will be able to predict outcomes such as infection and mortality rates at various time points during disease progression, depending on the control measures that are instituted.

### **Effectiveness of a 15-month destocking program.**

The effectiveness of a 15-month destocking program is currently being evaluated on 44 properties in NSW, Victoria and SA. All the properties have now been restocked with sheep believed to be free of OJD.

Infection has been detected in sheep on 7 farms that restocked in 1999 and early 2000. The source of infection is still being determined, however possibilities include survival of the organism on the farm, introduction with restocked sheep or transfer from neighbouring farms. Where evidence is available most breakdowns so far appear to be due to undetected infection in restocked sheep.

### **Basic research.**

A basic understanding of how OJD develops in individual animals, particularly in the first few months after infection, will assist in finding a suitable tool for diagnosis of the disease before bacteria are shed into the environment and may provide options for vaccine development. A major program of research is being developed to address these issues and will commence in September 2002.

Contact:  
Peter Rolfe, MLA Sydney  
Phone 02 9463 9314 or Email  
prolje@mla.com.au.

### **Tips & Tools**

Meat and Livestock Australia (MLA) has recently released an information booklet titled *On Farm Tips and Tools - Ovine Johne's Disease - diagnosis, management and control*. Funded by the National Ovine Johne's Disease Program (NOJDP), it is aimed at producers and presents facts about OJD in a clear and concise manner and is a result of a research forum held

in 2001 under the auspices of the NOJDP. The booklet contains background information about the disease, the available diagnostic tests, tips about how to avoid infection, how to manage infected flocks and what to do in the event that your property tests positive to OJD. If you would like further information or additional copies of the booklet, please contact the MLA Producer Hotline on 1800155900 or visit [www.mla.com.au](http://www.mla.com.au), or contact Animal Health Australia.

## INTERNATIONAL DEVELOPMENTS

The 7<sup>th</sup> International Colloquium on Paratuberculosis in Spain in June was attended by 270 people from around the world. About 20 Australians participated. This marked increase on attendance at the last Colloquium in Melbourne in 1999 reflects increasing interest and investment in Johne's research and control in many parts of the world/

While recognising difficulties and challenges still facing people involved in control, the number, quality and diversity of scientists now addressing many of these issues is encouraging. Presentations and discussions highlighted Australia's position as a leader in Johne's disease research, assurance and control.

Some outcomes from the Colloquium included:

- Continuing evidence that the infection is spreading and also affecting new species.
- The nearly completed analysis of the genetic makeup of *M paratuberculosis*, and new technology identifying genes and their effects and new approaches to detecting DNA by PCR may lead to better diagnostic tests.
- There have been no real advances in serological tests but new profiling methods are being trialled to improve interpretation of results both for individual animals in infected herds and at the herd level.
- An international study of culture methods found a wide range of capabilities among laboratories and emphasised the need for a high degree of quality control.
- *M paratuberculosis* was reported to have been identified more frequently in a sample of people with Crohn's disease in Europe and there have been some genetic differences in organisms cultured from animals and people .

The next International Colloquium will be held in Denmark in 2005.

David Kennedy  
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**AHA's National Coordinators**

4 September 2002