

Australian encephalitis: Sentinel Chicken Surveillance Programme

Sentinel chicken flocks are used to monitor flavivirus activity in Australia. The main viruses of concern are Murray Valley encephalitis (MVE) and Kunjin which cause the potentially fatal disease encephalitis, in humans. Currently 30 flocks are maintained in the north of Western Australia, 9 in the Northern Territory, 12 in New South Wales and 10 in Victoria. The flocks in Western Australia and the Northern Territory are tested year round but those in New South Wales and Victoria are tested only from November to March, during the main risk season.

Results are coordinated by the Arbovirus Laboratory in Perth and reported bimonthly. For more information and details of the location of sentinel chicken sites see Commun Dis Intell 2000;24:8-9.

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Sentinel chicken serology was carried out for 29 of the 30 flocks in Western Australia in January and February 2001. There were 5 seroconversions to flaviviruses in January, 3 from the Kimberley and 2 from Ophthalmia Dam (near Newman) in the Pilbara. In February the number of seroconversions increased, particularly in the Kimberley region. There were 29 seroconversions in the Kimberley and one from the town of Newman in the Pilbara. The number of chickens positive for flavivirus antibodies by ELISA at each

site and the identity of the infecting virus(es) are shown in Table 1. As a result of these findings the Health Department of Western Australia issued a second health warning to residents living in these areas warning of the increased risk of infection with MVE virus. The Kimberley Public Health Unit has issued similar warnings to Kimberley Aboriginal communities.

Sentinel chicken serology was carried out for 28 of the 30 flocks in Western Australia in March and April 2001. There were 17 seroconversions to flaviviruses in March from the Kimberley and 33 from the Pilbara. The number of chickens positive for flavivirus antibodies by ELISA at each site and the identity of the infecting virus(es) are shown in Table 2. As a result of these findings the Health Department of Western Australia issued a third health warning to residents living in these areas warning of the increased risk of infection with MVE virus. The Kimberley, Pilbara and Gascoyne Public Health Units have issued similar warnings to Aboriginal communities. In April activity decreased significantly and there were 3 seroconversions in the Kimberley (2 MVE, 1 FLAVI) and 4 seroconversions to MVE from Ophthalmia and the Harding dams in the Pilbara. There have been no cases of MVE reported from Western Australia.

The Western Australian sentinel chicken program is funded by the Health Department of Western Australia.

Serum samples from all of the 8 Northern Territory sentinel chicken flocks were tested at the University of Western Australia in January and February 2001. There was one new seroconversion to Kunjin virus in January from Katherine. In February there was a total of 14 new seroconversions to flaviviruses. The number of chickens positive for flavivirus antibodies by ELISA at each site and the identity of the infecting virus(es) are shown in Table 3. In addition there were 2 suspected cases (subsequently confirmed) of encephalitis caused by MVE virus from Alice Springs.

Table 1. Flavivirus seroconversions in Western Australian sentinel chicken flocks, January to February 2001

Location	January 2001			February 2001		
	MVE	KUN	FLAVI	MVE	KUN	MVE/KUN
Kimberley						
Wyndham				3		4
Kununurra	1	1		4*	2	1*
Halls Creek				4		1
Fitzroy Crossing				5	1	2
Derby	1			1		
Broome				1		
Pilbara						
Newman (town)				1		
Ophthalmia Dam		1	1			

MVE antibodies to Murray Valley encephalitis virus detected by ELISA

KUN antibodies to Kunjin virus detected by ELISA

FLAVI antibodies to a flavivirus only detected by ELISA

* some results not yet confirmed

Table 2. Flavivirus seroconversions in Western Australian sentinel chicken flocks, March to April 2001

Location	March 2001			April 2001		
	MVE	KUN	MVE/KUN	FLAVI	MVE	FLAVI
Kimberley						
Kalumburu						1 [#]
Wyndham					1 [#]	
Halls Creek	3				1	
Fitzroy Crossing	1		1			
Derby			1	1		
Broome	8		1			
Lombadina	1					
Pilbara						
Port/South Hedland	6		1			
Karratha	2					
Harding Dam	5				1 [#]	
Marble Bar	1					
Pannawonica	2					
Tom Price	8					
Ophthalmia Dam	2	1			2	
Newman town	1		1			
Exmouth	3					

MVE antibodies to Murray Valley encephalitis virus detected by ELISA

KUN antibodies to Kunjin virus detected by ELISA

FLAVI antibodies to a flavivirus only detected by ELISA

Table 3. Flavivirus seroconversions in the Northern Territory sentinel chicken flocks, January to February 2001

Location	January 2001		February 2001		
	KUN	MVE	KUN	MVE/KUN	FLAVI
Howard Springs				1*	
Katherine	1		1*		1*
Tennant Creek		2		2	
Alice Springs		3*	1*	2*	1*

MVE antibodies to Murray Valley encephalitis virus detected by ELISA

KUN antibodies to Kunjin virus detected by ELISA

FLAVI antibodies to a flavivirus only detected by ELISA

* some results not yet confirmed

Health warnings have been issued by the Territory Health Department.

Serum samples from all of the 8 Northern Territory sentinel chicken flocks were tested at the University of Western Australia in March and April 2001. There were 11 new seroconversions to flaviviruses in March and 5 in April. The number of chickens positive for flavivirus antibodies by ELISA at each site and the identity of the infecting virus(es) are shown in Table 4. A new case of MVE, with a date of onset in March 2001, was reported and the patient's travel history suggests the infection was acquired in the Northern Territory.

For the first time since 1974 there have been seroconversions to MVE and Kunjin viruses in the New South Wales sentinel chicken flocks. Flavivirus activity was detected in 7 of the 12 flocks with 8 seroconversions

occurring in January 2001 and 5 in February 2001. The number of chickens positive for flavivirus antibodies by ELISA at each site and the identity of the infecting virus(es) are shown in Table 5. To date there have been no cases of encephalitis caused by MVE virus reported from the region.

Flavivirus activity was again detected in New South Wales in March 2001 but not in April. MVE virus antibodies were detected in 2 of the 12 flocks and Kunjin virus antibodies in 8 of the 12 flocks. The number of chickens positive for flavivirus antibodies by ELISA at each site and the identity of the infecting virus(es) are shown in Table 5. To date there have been no cases of disease caused by MVE or Kunjin viruses reported from the region.

In addition to the activity in New South Wales there have also been 12 seroconversions to Kunjin virus in 4 of the 10 Victorian sentinel chicken flocks in February 2001. Kunjin

virus antibodies were detected in 4 chickens at Mildura, 5 chickens at Tooleybuc, 2 chickens at Barmah and 1 chicken at Barooga. The last Kunjin virus seroconversions in Victoria prior to this season were reported in March 1998 from the Mildura flock.

There were 7 new seroconversions, all to Kunjin virus, reported from the Victorian sentinel chicken flocks in March 2001. Kunjin virus antibodies were detected in 3 chickens at Mildura, 3 at Tooleybuc and 1 at Kerang. Two further seroconversions to Kunjin virus were detected from Kerang

in late April. There have been no cases of disease caused by either MVE or Kunjin viruses reported from the region. The sentinel chicken surveillance programs in both Victoria and New South Wales have been extended until May 2001.

Details of the locations of all chicken flocks are given in Spencer JD, Broom AK, Buick TD, Daniels PW, Doggett SL, Hapgood GD, et al. Murray Valley encephalitis virus surveillance and control initiatives in Australia. *Commun Dis Intell* 2001;25:33-48.

Table 4. Flavivirus seroconversions in the Northern Territory sentinel chicken flocks in March and April 2001

Location	March 2001			FLAVI	April 2001	
	MVE	KUN	MVE/KUN		MVE	FLAVI
Howard Springs		1				
Leanyer Coastal Plains					1	1
Katherine		1	1	2		
Tennant Creek	6				2 [#]	
Alice Springs					1 [#]	

MVE antibodies to Murray Valley encephalitis virus detected by ELISA

KUN antibodies to Kunjin virus detected by ELISA

FLAVI antibodies to a flavivirus only detected by ELISA

[#] some results not yet confirmed

Table 5. Flavivirus seroconversions in New South Wales sentinel chicken flocks, January to March 2001

Location	January 2001		February 2001			March 2001		
	MVE	KUN	MVE/KUN	MVE	KUN	MVE	KUN	MVE/KUN
Menindee	2	1	1					
Macquarie Marshes	2			1		1	5	
Wanaaring	1		1				1	
Griffith					1		1	
Bourke					1	1	5	1
Ford's Bridge					2		1	
Deniliquin							1	
Lake Cargelligo							1	
Leeton							9	

MVE antibodies to Murray Valley encephalitis virus detected by ELISA

KUN antibodies to Kunjin virus detected by ELISA

FLAVI antibodies to a flavivirus only detected by ELISA