Wild Bird News

National Avian Influenza Wild Bird Surveillance Newsletter - June 2021

Pink-eared ducks - Image Courtesy of Guy Weerasinghe

NAIWB Surveillance Program activities

The National Avian Influenza Wild Bird (NAIWB) Steering Group ensures national coordination and collaboration of wild bird avian influenza virus (AIV) surveillance activities conducted Australia-wide and comprise two sampling components. The first is pathogen-specific, risk-based targeted surveillance, which faecal environmental swabs and cloacal and/or oropharyngeal samples are collected from apparently 'healthy' wild birds and hunter-shot wild birds of known AIV reservoir species (including waterfowl and shorebirds) at key location across Australia and tested for avian influenza virus (AIVs). The second is general surveillance and involves investigation of significant morbidity and mortality events in wild birds, including zoo bird population (with a focus on exclusion-testing for AIV subtypes H5 and H7). The diagnostic investigation considers history, clinical signs and/or histopathology, prevailing environmental conditions or detection of other pathogens or diagnoses.

Activities are funded by the **Australian Government Department of Agriculture, Fisheries and Forestry** (DAFF), in addition to in-kind support provided by the jurisdictional agencies, researchers and representative's institutions. Further background on the NAIWB surveillance program can be found in **Wild Bird News**.

Data generated by the NAIWB program is used to monitor and understand distribution of avian influenza virus infection in wild birds. Subsequent sequence analysis of the AIVs detected in wild birds further contributes to tracking Australian virus evolution and dynamics, maintaining currency of diagnostic tests, and maintaining a virus sequence library allowing comparison of Australian and overseas strains.

Avian Influenza Virus

To date, 16 haemagglutinin (HA; H1-H16) and 9 neuraminidase (NA; N1-N9) subtypes are recognised in birds. **Waterfowl and shorebirds are the main natural reservoirs and rarely show signs of disease.** Avian Influenza Virus (AIV) can cause significant infectious disease in domestic poultry and can also infect and/or cause disease in a range of other species including other captive birds, wild birds, and humans[1,2].

Of global concern is the capacity of AIV subtypes H5 and H7 to mutate from Low Pathogenicity (LPAI) into **High Pathogenicity (HPAI) forms which can cause significant losses in both poultry and wildlife, and potentially human health issues.**

AIV in Australia

HPAI H5 viruses have not been detected in Australia. As of June 2021, there have been eight outbreaks due to HPAI H7 viruses in commercial Australian poultry operations between 1976 and 2020 in the states of Victoria, Queensland and New South Wales[3,4,5,6,7,8,9].

Mortality due to AIVs have not been reported in feral or native free-ranging birds[10]. However, **LPAI viruses have been detected in wild birds in Australia.**

Given Australia's geographic and ecological isolation, **it is important that assumptions about AIV epidemiology in Australia are not based entirely on studies from Asia, Europe or North America[11,12].**

More info: WHA FACT SHEET

Data provided in this document should be considered preliminary and may be changed.

New research finds the risk of an Avian Influenza outbreak in Australia peaks two years after a high-rainfall period*

Outbreaks of Avian Influenza Virus (AIV) in the Australian poultry industry predominantly (if not exclusively) originate from wild waterfowl. In Australia, where large parts of the country experience erratic rainfall patterns, above average high rainfall followed by extensive dry periods drive AIV dynamics in wild birds.

Intense rainfalls lead to mass wild waterfowl breeding events. When next the landscape starts to dry out and waterfowl start to flock, AIV prevalence in these wild bird groups increases. Not only because of increasing contact rates but also because there is an increase in the number of young birds that have not been exposed to AIVs circulating in wild birds in Australia before and are thus more susceptible to infection. During these dry periods, wild waterbirds aggregate on permanent natural wetlands or man-made waterbodies (e.g dams) which increases the risk of (direct and indirect) contact between waterfowl and commercial poultry.

Black swan being swabbed by Simeon Lisovski and Marcel Klaassen
Image Courtesy of Marta Ferenczi

These dynamics occur over a long period of time and new research from NAIWB Steering Group member Prof Marcel Klaassen's laboratory at Deakin University has found that the risk of AIV outbreaks in commercial poultry peaks two years after the onset of a high-rainfall period. This research used weather and AIV detection data from the Murray-Darling basin and the region immediately surrounding it in southeast Australia[13].

Marcel Klaassen and a trapped pacific black duck during field work - Image Courtesy of David Roshier

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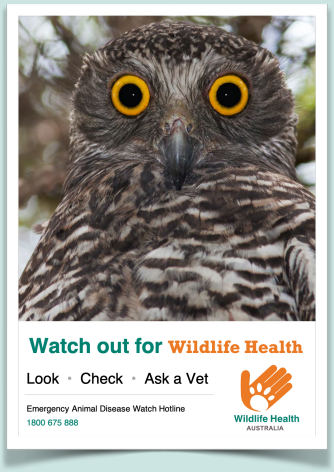
*Article first published at the National Poultry Newspaper Vol. 4 No. 11.

Having identified this key environmental risk factor for AIV outbreaks in Australian commercial poultry, Prof Klaassen and his team are currently working on generating a risk assessment model that will allow identification of AIV outbreak risks in real-time. Whilst further work is required to investigate these dynamics and develop tools to support industry, the findings are useful in informing biosecurity considerations on farms.

Australian Chicken Meat Federation Executive Director Dr. Viv Kite says, “It is an interesting piece of research that confirms the industry’s understanding that avian influenza spill-over events from wild birds to commercial poultry have tended to be associated with weather, in particular rainfall events in current and preceding years. It highlights that poultry producers should include weather and wild bird monitoring as part of their biosecurity strategies to identify weather cycles likely to contribute to an increased risk of avian influenza on their farms. During periods of elevated risk, producers need to be particularly vigilant in terms of monitoring for wild bird activity in the vicinity of their farms and in adhering to existing industry biosecurity standards[14] targeted at minimising contact between wild birds and farmed poultry.”

For more information, contact Prof Marcel Klaassen: marcel.klaassen@deakin.edu.au.

Field work- Image Courtesy of David Roshier



AVIAN INFLUENZA IS A NATIONAL NOTIFIABLE DISEASE AND REQUIRES REPORTING TO THE CHIEF VETERINARY OFFICER (CVO) AT THE APPROPRIATE AUSTRALIAN STATE OR TERRITORY

If you would like information about Avian Influenza testing and sample collection, please seek advice from your local WHA Coordinator or call the Emergency Animal Disease Watch Hotline (**1800 675 888**).

Targeted surveillance - Jan to Jun 2021

Between January and June 2021, AIV-specific, risk-based surveillance occurred at sites in New South Wales, Northern Territory, Queensland, South Australia, Tasmania, Victoria and Western Australia with cloacal and faecal environmental swabs collected from 2763 waterbirds. Samples were tested using RT-PCR for AIV M (matrix) gene detection. Influenza A reactors (positives) to the influenza A matrix gene PCR were tested using specific qRT- PCRs for influenza A H5 and H7. Samples for which H5/H7 subtypes were detected by RT-PCR were dispatched to the CSIRO Australian Centre for Disease Preparedness (ACDP) for confirmatory and further testing.

Targeted surveillance - Influenza A virus detections (Jan - Jun 2021)

State / Territory	# Individual Swabs Collected[a]	# Positives[b]	H5 LPAI	H5 HPAI	H7 LPAI	H7 HPAI	Other LPAI HA SubtypesC[c]
NSW	548	4	0	0	0	0	
NT	274	0					
Qld	497	12	0	0	0	0	H6
SA	387	4	0	0	0	0	H2
TAS	453	30	2	0	0	0	H9, H11
VIC	206	21	3	0	1	0	H1, H3, H6, H8, H9
WA	398	4	0	0	0	0	H11
Total	**2763**	**75**	**5**	**0**	**1**	**0**	

[a] Swabs include faecal environmental and cloacal (and/or oropharyngeal) swabs.

[b] A number of swabs were tested as a pooled sample (up to 3 swabs in one pool). A positive pool represents one AIV positive. A sample is considered AIV positive if either: a) Positive at original lab; b) Indeterminate at original lab and subsequently tested positive; c) Indeterminate at original lab and subtyped at any lab.

[c] When positive AIV samples (not identified as H5 or H7) are submitted for subtyping and successful.

Between January and June 2021, no HPAI viruses were identified, but targeted surveillance continues[12,15] to find evidence of a wide range of low pathogenicity virus subtypes, including LPAI H5 and H7.

Molecular analysis of AIVs detected through the targeted surveillance activities contribute to: tracking Australian virus evolution and dynamics, maintaining currency of diagnostic tests, maintaining a virus sequence library allowing comparison of Australian and overseas strains. This information informs risk to industry and response to detections in poultry.

From January to June 2021, species targeted for sampling were from orders Anseriformes and Charadriiformes.

Other bird orders may have been present during sample collections. The great majority of samples collected during this period were faecal environmental swabs. A small proportion of cloacal samples from hunter-shot birds were also collected.

General surveillance - Jan to Jun 2021

Wild bird morbidity and mortality investigation are reported into the Australia's wildlife health information system (eWHIS) via a network of state / territory WHA coordinators (appointed by their respective Chief Veterinary Officer), and WHA environment representatives, the Northern Australia Quarantine Strategy (NAQS), veterinarians at zoo-based wildlife hospitals and sentinel wildlife clinics, university clinics and pathology departments, researchers, other wildlife health professionals and WHA members. General surveillance summary tables (below) are drawn from data entered into eWHIS. WHA received 66 reports of wild bird mortality or morbidity investigations from around Australia from January to June 2021, which were tested for AIV by PCR for influenza A. Investigations may involve a single animal or multiple animals (e.g. mass mortality event). Reports and samples from sick and dead birds are received from members of the public, private practitioners, universities, zoo wildlife clinics and wildlife sanctuaries.

General surveillance - mortality and morbidity events in which birds were tested for Influenza A viruses (Jan - Jun 2021)

Bird Order	Common Names for Bird Order[16]	Number of Events AIV Tested via PCR[a]	Number of Events AIV Positive
Accipitriformes	Osprey, hawks and eagles	3	
Anseriformes	Magpie Goose, ducks, geese and swans	10	
Caprimulgiformes	Frogmouth and nightjars	2	1[b]
Charadriiformes	Shorebirds	4	2[c]
Columbiformes	Doves and pigeons	5	
Coraciiformes	Bee-eaters and kingfishers	1	
Falconiformes	Falcons	1	
Gruiformes	Rails, gallinules, coots and cranes	2	
Passeriformes	Passerines or perching birds	18	
Pelecaniformes	Ibis, herons and pelicans	3	
Procellariiformes	Fulmars, petrels, prions and shearwaters	1	
Psittaciformes	Parrots and cockatoos	22	
Sphenisciformes	Penguins	3	
Strigiformes	Owls	3	
Suliformes	Gannets, boobies and cormorants	2	

[a] Disease investigations may involve a single or multiple bird orders (e.g. mass mortality event). The number of events where AIV was tested via PCR against each bird order do not equal the total number of investigations due to multi-species events. During the semester, seven wild bird events involved multiple bird orders tested for AIV. One event involved the orders Anseriformes, Columbiformes, Passeriformes, Pelecaniformes and Psittaciformes, the second event involved Columbiformes, Coraciiformes, Passeriformes, Pelecaniformes and Psittaciformes, the third event involved Anseriformes, Passeriformes and Psittaciformes, the fourth and fifth events involved Passeriformes and Psittaciformes, the sixth event involved

Avian influenza was not confirmed as the cause of any wild bird morbidity or mortality event between January and June 2021 reported to eWHIS.

[b]AIV was detected in one captive tawny frogmouth from a mortality event in which eight aviary birds at a wildlife park died. Histopathology findings included bacterial air sacculitis and pneumonia. Testing for H5 and H7 was negative. Further work is underway.

[c]AIV was incidentally detected in two silver gull mortality events at closely located sites in Launceston, Tas. Clinical examination and pathology findings from both events were not consistent with avian influenza in any of the sampled birds. These incidental findings are not unusual given that shorebirds (Charadriiformes) are an AIV reservoir species. More information can be found at WHA Animal Surveillance Quarterly Report, Volume 26, Issue 1.

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Disclaimer

This document was developed and approved by the National Wild Bird Avian Influenza (NAIWB) Steering Group for information purposes only. NAIWB Steering Group was established to ensure national coordination and collaboration of wild bird avian influenza surveillance activities. Wildlife Health Australia provides support to the NAIWB Steering Group and collates avian influenza surveillance data from wild birds sampled across Australia. Information contained in it is drawn from a variety of sources external to Wildlife Health Australia. Data is provided on an "as is" basis and may be changed periodically; these changes may or may not be incorporated in any new version of the publication. Although reasonable care was taken in its preparation, Wildlife Health Australia does not guarantee or warrant the accuracy, reliability, completeness, or currency of the information or its usefulness in achieving any purpose. To the fullest extent permitted by law, Wildlife Health Australia will not be liable for any loss, damage, cost or expense incurred in or arising by reason of any person relying on information in this document. You may download, display, print and reproduce this material in unaltered form only for personal, non-commercial use or use within your organisation, provided due acknowledgement is made of its source. For any other use of the material contained in this document (including, but not limited to any text, illustration, table, or any other material), written permission must be obtained with Wildlife Health Australia and the NAIWB Steering Group.

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