Wild Bird News

National Avian Influenza Wild Bird Surveillance Newsletter - December 2019

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 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.**

AIV in Australia

HPAI H5 viruses have not been detected in Australia. As of December 2019, there have been seven outbreaks due to HPAI H7 viruses in commercial poultry operations since 1976 in Victoria, Queensland and the last in 2013 in New South Wales[3,4,5,6,7,8].

Mortality due to AIVs have not been reported in feral or native free-ranging birds[9]. 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[10,11].**

More info: WHA FACT SHEET


Pink-eared duck - Image Courtesy of Ákos Lumnitzer - amatteroflight.com

Low Pathogenicity Avian Influenza H7 detections in South Australia in November 2019

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. As part of the targeted surveillance component of the NAIWB surveillance program, samples are collected from known wild bird reservoirs - e.g. waterfowl and shorebirds - at key location across Australia and tested for avian influenza virus (AIVs). Activities are funded by the Australian Government Department of Agriculture, Water and the Environment, 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 - December 2018.

Between July and December 2019, targeted surveillance occurred at sites in New South Wales, Queensland, South Australia, Tasmania, Victoria and Western Australia. All the 3364 faecal environmental swabs and the 53 cloacal swabs collected from waterbirds were tested for AI viruses (AIVs). No high pathogenicity avian influenza (HPAI) viruses were identified. Targeted surveillance activities continued to find evidence of low pathogenicity avian influenza (LPAI) viruses in wild waterbirds across Australia (See page 4 for details).

In November 2019, faecal environmental samples collected from waterfowl at Bolivar, South Australia, resulted in an unusually high number of LPAI H7 being detected. Avian influenza subtypes H5 and H7 have the capacity to mutate from LPAI into HPAI forms which can cause significant losses in both poultry and wildlife. So, this finding raised concern, in particular, due to history of HPAI outbreaks in commercial poultry in Australia all being due to H7 subtypes[12]. All of the HPAI H7 outbreaks in poultry in Australia were linked to obvious or circumstantial evidence of contact with waterfowl or inadequately treated surface water, potentially contaminated by waterfowl.

Of the 300 faecal environmental swabs collected (analysed as 100 pools of three faecal environmental swabs each), 13.3% (n=40/300) were positive for influenza A using RT-PCR for AIV matrix gene detection. Subsequent subtype analysis of the AIV positive samples identified twenty LPAI H7s (n=20). Samples positive for LPAI H7 were found in combination with N1, N3 and N9, suggesting multiple LPAI H7 viruses circulating at the time of sampling. Between 2011-2019, the number of LPAI H7 and LPAI H5 detected from wild birds sampled from locations across Australia as part of targeted NAIWB surveillance activities ranged from 0 to 29 per year. See histogram on page 3.

Following high detection of LPAI H7 results, Biosecurity SA provided advice to poultry industry and recommended producers to take extra measures to deter wild birds from poultry farms over summer, including:

- Minimise access of feed to wild birds:
  - Keep feed inside if possible
  - Place covers on feed pans/troughs
  - Check feed pans, troughs and silos regularly and clean feed spills as soon as possible
- Minimise access of water to wild birds:
  - Prevent pooling of water next to sheds or on the range
  - Place covers on water troughs or other types of drinkers
  - Prevent pooling of water around water troughs/drinkers
- Treat water used on the farm:
  - Regularly verify that water is being effectively treated e.g. use chlorination strips.

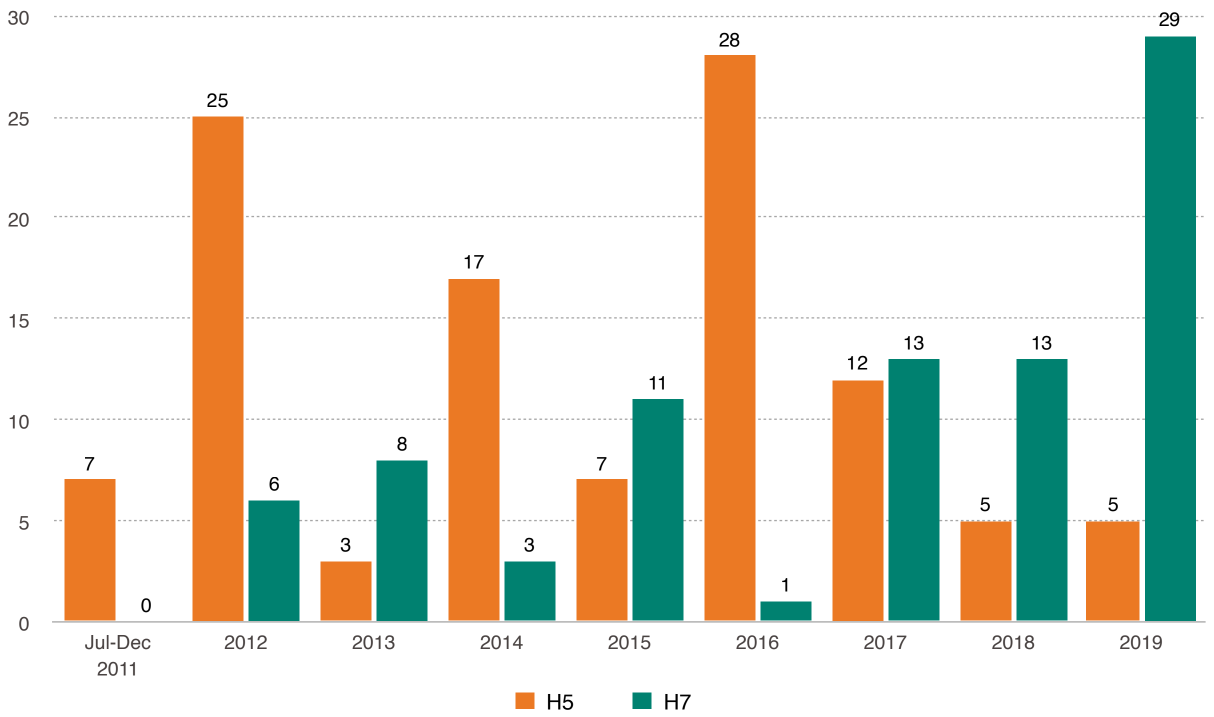
Biosecurity essentials for poultry producers can be found at www.farmbiosecurity.com.au.

Communication of wild bird AIV information can be used to strengthen biosecurity messages to industry through enhancing producer awareness of risk and encourages better biosecurity compliance.

Wildlife Health Australia prepared a detailed report, with input from Biosecurity SA, the Australian Government Department of Agriculture, Water and the Environment and CSIRO Australian Centre for Disease Preparedness, to key Commonwealth and State and Territory government agencies.

In order to understand potential ongoing risks to the poultry industry, Biosecurity SA (with industry support) also undertook further wild bird AIV sampling at additional locations known to have large aggregations of wild ducks in the near vicinity to free range poultry farms. None of the 300 wild bird faecal environmental samples collected was AIV positive, however caution needs to be advised as this is not necessarily a measure of the AIV risk due to the mobility of the wild bird populations.

Number of LPAI H5 and H7 detections from wild birds in Australia by year



Has this been observed before?

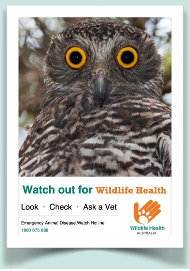
Studies have confirmed AIV infection dynamics in Australian wild birds are complex and fluctuate both temporally and geographically[11,13,14,15,16]. Dominance of 1 or 2 haemagglutinin subtypes (e.g. H1-H16) has been previously observed at a single sampling site and time as part of wild bird AIV targeted surveillance activities in Australia. High numbers of LPAI H5s, compared to previous years, have been detected during targeted wild bird AIV surveillance activities in New Zealand (see **Surveillance NZ 2014 Vol 41, Issue 3**) and in Canada (see **Inter-agency Wild Bird Avian Influenza Survey Update, live bird survey 2015**).

Analysis of AIVs from wild birds continues to provide valuable ecological, epidemiological and genomic information that contributes to strategic risk assessment, management and communication. Communication of results from wild bird AIV targeted surveillance can be used to reinforce the importance of biosecurity, enhance awareness and encourage better biosecurity compliance, specifically to poultry producer.

Find out more about the key outputs from the NAIWB surveillance program in previous issues of Wild Bird News. **Wild Bird News - June 2019** highlights the importance of monitoring AIV in wild birds, which contributes to the ongoing capacity to rapidly and reliably test for AIVs of any subtype in Australian poultry and wild birds.

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 - Jul to Dec 2019

Between July and December 2019, AIV-specific, risk-based surveillance occurred at sites in New South Wales, Queensland, South Australia, Tasmania, Victoria and Western Australia with cloacal or faecal environmental swabs collected from 3417 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.

Target Surveillance - Influenza A virus detections (Jul - Dec 2019)

State / Territory	# Individual Swabs Collected	# Positives*	H5 LPAI	H5 HPAI	H7 LPAI	H7 HPAI	Other LPAI HA Subtypes**
NSW	522	6	0	0	1	0	H8
NT	0						
Qld	1317	11	1	0	0	0	H1, H4
SA	900	54	0	0	21	0	H1, H2, H6, H9, H11
TAS	131	1	0	0	0	0	
VIC	45	5	0	0	0	0	H9, H13, H16
WA	502	2	0	0	0	0	H8
Total	**3417**	**79**	**1**	**0**	**22**	**0**	

* 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.

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

Between July and December 2019, no HPAI viruses were identified, but targeted surveillance continues[11,17] 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 July to December 2019, species targeted for sampling were from the order Anseriformes.

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.

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

General surveillance - Jul to Dec 2019

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), veterinarians at zoo based wildlife hospitals and sentinel wildlife clinics, university clinics and pathology departments, as well as other wildlife health professionals. General surveillance summary tables (below) are drawn from data entered into eWHIS.

WHA received 32 reports of wild bird mortality or morbidity investigations from around Australia from July to December 2019, 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 (Jul - Dec 2019)

Bird Order	Common Names for Bird Order [18]	Number of Events AIV Tested via PCR*	Number of Events AIV Positive
Anseriformes	Magpie Goose, ducks, geese and swans	3	0
Charadriiformes	Shorebirds	3	0
Columbiformes	Doves and pigeons	2	0
Gruiformes	Rails, gallinules, coots and cranes	1	0
Passeriformes	Passerines or perching birds	7	0
Pelecaniformes	Ibis, herons and pelicans	4	0
Procellariiformes	Fulmars, petrels, prions and shearwaters	2	0
Psittaciformes	Parrots and cockatoos	9	0
Sphenisciformes	Penguins	2	0
Strigiformes	Typical owl and barn owls	1	0

* 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, two wild bird events involved multiple bird orders tested for AIV. One event involved the orders Columbiformes and Passeriformes, and the second event involved Charadriiformes and Gruiformes.

Avian influenza was not the cause of any wild bird morbidity or mortality event between July and December 2019 reported to eWHIS.


Image Courtesy of Guy Weerasinghe

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

Disclaimer

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