



Pigeon rotavirus in New Zealand – resources



The New Zealand situation

Pigeon rotavirus infection was confirmed in March 2019 in racing pigeons in Canterbury and Auckland by RT-qPCR testing, carried out by Biosecurity New Zealand in partnership with the Australian Animal Health Laboratory (AAHL), Geelong, Victoria. Next-generation sequencing is currently underway to ascertain if it is the group A, genotype G18P virus that was the cause of outbreaks of disease in Australia in 2016/17 and Europe in 2017. The expected date for this analysis to be completed is about mid-April. The following advice assumes that the virus is probably the same or closely related to the strain seen in Australia, given the similarities in clinical presentation, gross pathology and histopathology. It draws upon the findings from Australia and Europe, and cases in New Zealand.

Notifiable diseases, such as avian influenza (AI), Newcastle disease virus (NDV) and pigeon paramyxovirus, have been ruled out as the cause of illness.

Rotavirus has been detected from three racing pigeon lofts in New Zealand with dates of infection extending back to late December 2018. Sixteen Canterbury lofts had a vomiting/diarrhoea syndrome (with low mortality ~5%) in late Feb 2019, one Auckland loft had a comparable syndrome in December 2018. Samples from the December case were archived by the private vet and testing was carried out when the further cases were suspected this February.

The pathway of entry into New Zealand is unclear at this point. Suspect pathways would include the migration of birds or an accidental introduction route, such as contaminated equipment. The Australian rotavirus strain is closely related to a rotavirus isolated in Europe in 2017, indicating that intercontinental spread is not unprecedented.

Background

In 2016, a pigeon (*Columba livia*) rotavirus outbreak was identified in Western Australia. Over the next two years, similar outbreaks manifested throughout most of the Australian states. In 2017, a European outbreak of pigeon diarrhoea, vomiting, and hepatic necrosis was attributed to a specific lineage of rotavirus, closely related to that identified in the 2016 Australian outbreaks.

Signs of disease mostly include vomiting and diarrhoea. Birds that appear sick often die within 12 to 24 hours. Clinical signs include:

- depression – reluctance to go out and fly
- vomiting/regurgitation
- diarrhoea
- hunched posture
- mortality is generally low (around 5%), although in some situations in Australia it appears to have been higher.

Gross post-mortem findings may be unremarkable, although changes to the liver, intestines and spleen may be seen, e.g. haemorrhages. Consistent histological findings include significant hepatic necrosis, with an often marked macrophage infiltration. The spleen will often also have an inflammatory infiltrate, most often containing macrophages. Lesions in other organ systems such as the gut are inconsistent and may be absent.

The disease has to-date (in Australia, Europe and NZ) only affected pigeons (*Columba livia*). The virus has the potential to affect all variants of this species, including: racing pigeons, fancy breeds and feral rock pigeons. The New Zealand wood pigeon/kererū (*Hemiphaga novaeseelandiae*) and Chatham Island pigeon/parea (*Hemiphaga chathamensis*), although termed “pigeons” belong to a different genus. It is currently unknown at this stage whether the virus can affect them. The risk to commercial poultry (chickens, ducks, and turkeys) is considered low based on field experience and trials in Australia.

There is no known human health impact.

Advice for pigeon owners with suspected rotavirus in their flock

Rotavirus infection in domestic pigeons is not a Notifiable disease in New Zealand. Your **veterinarian** (or an **avian specialist veterinarian**, if required) is best placed to assist

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you if you suspect your pigeons may be affected by the rotavirus. Treatment is largely supportive in the form of fluids, electrolytes and gut stabilisers. Biosecurity measures to limit spread in the group will include not mixing affected birds with others, and minimising cross-contamination (see below).

Testing options:

Owners of pigeons with syndromes suggestive of rotavirus should consult their vet for treatment and management advice. Your vet is best placed to assess whether it would be useful to submit samples (or whole dead birds) for testing at a commercial veterinary laboratory. All testing would be done on a user pays basis and is not funded by the Ministry for Primary Industries. Samples can only be submitted by a veterinarian.

In dead birds, characteristic liver pathology is often present when histological (microscopic) examination is undertaken. Your vet may consider collecting samples (into formalin) for histological examination, and at the same time submitting fresh liver (to be kept on-hold, frozen, at the laboratory). The fresh liver sample could be submitted for molecular testing at Biosecurity New Zealand's Laboratory on a user-pays basis. Please note, however that currently there is no molecular test available in NZ for pigeon rotavirus - confirmation of the initial three cases has been carried out in partnership with the Australian Animal Health Laboratory (AAHL), Geelong, Victoria, and there would be additional expense in sending samples to this laboratory. The possibility of establishing molecular testing capability for rotavirus in New Zealand is under consideration.

Treatment and management advice:

Treatment and management options should be discussed with your vet. In general rotaviral infections require only supportive treatments, such as oral fluids and electrolytes, to ensure the birds are kept well-hydrated and in a positive energy balance. Gut stabilisers (such as 'Scourban') may also be useful to limit the worst of the diarrhoea. This allows the virus to run its course with as little negative impact on the birds as possible. Antibiotics are believed to have limited value as they do not combat the virus that causes the disease and will generally not be used for mass flock-wide medication. Antibiotic (and other) medications may be appropriate in individual, severely affected birds to treat bacterial co-infection – discuss with your vet.

Biosecurity New Zealand is investigating whether a vaccine is available.

Biosecurity advice

The pigeon industry is taking precautions by enhancing biosecurity measures to limit the spread and impact of pigeon rotavirus. At this time, pigeon owners should be extra vigilant and strengthen their biosecurity.

Pigeon fanciers should maintain strict biosecurity measures, including (but not limited to):

- Avoid bringing new diseases into your flock:
 - It's important to be aware that birds may carry the virus even though they appear to have recovered. Australian research suggests a potential carrier state to around 12 weeks.
 - Designate specific gumboots and overalls/clothing that never leave the loft area, or wear disposable overshoes and/or overalls.
 - Do not mix sick birds with other birds – if you do have ill birds, take precautions not to cross-contaminate affected and unaffected areas of the loft e.g. during litter disposal or by sharing equipment.
 - Tend to young pigeons first before moving to older ones, as they may be more susceptible to diseases when young.
 - Minimise pigeon introductions, and if required, make appropriate enquiries to ensure they are only from trusted, healthy lofts. If new pigeons are introduced, a 2-3 week quarantine period is recommended where birds are segregated and observed for signs of illness. This will limit the introduction of new pathogens and bugs to your flock.
 - Clean and disinfect (e.g. Virkon, diluted bleach) any second-hand equipment, or equipment that needs to move between sick and healthy groups within your flock.
 - Restrict visitors to the minimum required.
- Avoid spreading disease from your flock to others:
 - Where contact with other pigeons occurs, clean and disinfect clothing and boots. Remove debris first, then follow up with a disinfectant solution (e.g. Virkon, diluted bleach). It is important to remove debris and organic matter first as disinfectants do not work in the presence of excess mud or waste material.
 - If your loft has been affected or if you have ill birds for any other reason, you should maintain strict biosecurity measures, including not selling, racing or showing pigeons, enhancing loft hygiene and restricting visitors to prevent disease spread.
 - Be aware that your recovered flocks may pose a risk of spreading disease for up to 12 weeks.

Native wood pigeons

Rotavirus poses a potential risk to New Zealand kererū (*Hemiphaga novaeseelandiae*) and Chatham Island pigeon/para (*Hemiphaga chathamensis*), although it is currently unknown whether the virus can affect them given they belong to a different genus. Enhanced surveillance for rotavirus infection is being initiated in native New Zealand wood pigeons. Enhanced surveillance effort for feral rock pigeons (*Columba livia*) is not being undertaken.

The Department of Conservation (DOC) should be notified when dead or ill native wood pigeons (kererū, parea) are found. Either DOC (0800 362 468) or the Ministry for Primary Industries (0800 80 99 66) should be informed where multiple birds are affected.

Further reading

- New South Wales DPI “Pigeon rotavirus” factsheet (PDF): <https://www.dpi.nsw.gov.au/animals-and-livestock/poultry-and-birds/health-disease/pigeon-rotavirus>
- Tasmania DPI – “Pigeon rotavirus” web resource page: <https://dpi.pwe.tas.gov.au/biosecurity-tasmania/animal-biosecurity/animal-health/poultry-and-pigeons/pigeon-rotavirus>
- Australian RSPCA *What is pigeon rotavirus?:* https://kb.rspca.org.au/what-is-pigeon-rotavirus-and-what-should-be-done-to-stop-it-spreading_696.html
- Australian Animal Health Surveillance Quarterly (2017). *Novel rotavirus in pigeons*. 2017 22(1). Available at: http://www.sciquest.org.nz/elibrary/download/133400/Novel_rotavirus_in_pigeons.pdf?%22

Technical resources

- Walker C. (2018). *Rotavirus in pigeons – The Australian experience*. International Veterinary Conference on Pigeon Pathology, Krakow, Poland. 7-8 June 2018. Available at: <http://www.anpa.com.au/uncategorized/colin-walkers-rotavirus-presentation-in-poland/>
- McCowan C *et al.* (2018). *A novel group A rotavirus associated with acute illness and hepatic necrosis in pigeons (Columba livia), in Australia*. PLOS ONE 2018 (Sept). Available at: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0203853>
- Rubbenstroth D *et al.* (2019). *Identification of a novel clade of group A rotaviruses in fatally diseased domestic pigeons in Europe*. *Transboundary and Emerging Diseases* 2019, 66(1):552-561. Available at: <https://onlinelibrary.wiley.com/doi/full/10.1111/tbed.13065>

Useful links

- New Zealand Poultry, Pigeon & Cage Bird Association: <http://www.nzpoultryassociationsinc.co.nz/>
- Pigeon Racing New Zealand: <http://www.prnz.org.nz/home>
- Australian National Pigeon Association: <http://www.anpa.com.au/>
- Australian National Racing Pigeon Board: <http://www.anrpb.org/>

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