Highly pathogenic H5N8 avian influenza hits South Africa
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Highly pathogenic H5N8 avian influenza was confirmed in chickens in South Africa on 22 June 2017. The first outbreak affected a broiler breeder flock in southern Mpumalanga, where one house of 7500 breeder birds died in three days. There were very few clinical and post-mortem signs. On the confirmed farm, AI serology was negative but H5N8-specific PCR was positive.

The second farm was diagnosed four days later, about 30km away from the first. This was a commercial layer farm. The egg-collecting conveyor belt, shared by three houses, is strongly suspected of playing a role in the spread of the infection.

On 11 July, two more outbreaks on commercial layer farms in Gauteng (370000 susceptible) and Mpumalanga (7000 susceptible) were confirmed (fig 1). Very high mortality rates have been experienced and the affected sites are being culled, as well as some houses close to affected sites.

As of 14 July, H5N8-positive wild birds have been found in two locations, in Mpumalanga and Gauteng. The species included a yellow-billed duck and weavers, which were showing signs of illness. This supports the strong suspicion that wild birds are the most likely source of the virus in poultry. The farm on which the virus was first detected is very close (<500m) to the Vaal River and the second is within 2km of a large dam. The virus strain is very similar to that from the outbreak in Zimbabwe, which was detected on 17 May, and from Egypt in 2016.

There is no blanket policy for culling, though it is the only currently-available option for controlling the spread of the disease. Internationally, wide culling zones have been abandoned. Farms will be considered on a case-by-case basis, based on epidemiological links between sites and houses and risk of spread. Though the risk of infection from eggs is not quantifiable, the decision was made to destroy the eggs laid by the affected breeder birds on the first farm.

Considerable challenges have been faced, relating to slaughtering of birds and carcass disposal. Animal welfare is important and there are enormous numbers of chickens to deal with. Gassing with argon (about 92%) and carbon dioxide has been found to be most humane and efficient, but the design of the containers has been challenging and equipment is needed to supply and mix the gasses.

Carcass disposal is a challenge in terms of volume of dead birds and the infectiousness of the material. Transporting the material would increase the risk of spread, but burying the material on-site risks irreversible water and environmental contamination (with viruses, bacteria and nitrogen, to name a few) and risk must be assessed by the Department of Environmental Affairs. Composting of dead birds in the houses appears to be a good way of decreasing the risk of virus spread. It is necessary to provide a sufficient carbon source, in the form of plant material, and to monitor the temperature of the heap. It has been advised that composting is done for 21 days, and the houses are left open for 21 days after disinfection. If correctly done, composting will kill the virus and any other pathogens and make the carcasses easier to dispose of by other means. A problem encountered with composting in layer houses is the presence of the cages.

Strict quarantine is applied to affected farms and an attempt is made to identify all properties with chickens within a 3km and 30 km zone, prioritizing commercial farms. Intensive clinical surveillance is then carried out on 3km farms and exports from compartments in this zone will not be allowed.
Initially the movement of spent hens was banned countrywide for a proposed period of two weeks. However, there was major objection by commercial layer farmers and cull buyers and an alternative plan was ready within a week. The Poultry Disease Management Agency (PDMA) is registering buyers and sellers of live birds for any purpose other than slaughter. Cull buyers have to provide a reconciliation every month of chickens bought and sold. Cull sellers must obtain a health certificate from the local state vet for each flock of birds sold.

In the latest outbreaks, the registration of cull chicken depots allowed forward tracing and, though it is hoped that these birds were consumed quickly, the possibility of affected birds remaining alive is being investigated.

This virus was spread mostly by vehicles, people and fomites in the US and UK. Farms should therefore apply very strict biosecurity in terms of person and vehicle access, as well as limiting exposure to wild birds and their excretions. Vets and officials visiting suspect and infected farms should also be very careful not to spread the disease. Protective clothing should preferably be left behind on the farm and sample packaging well-disinfected.

In the case of increased mortalities in wild birds or poultry, contact the local state vet (in the Western Cape: http://www.elsenburg.com/services-and-programmes/veterinary-services-0fs=Animal-Health-and-Disease-Control) and send spleen, liver, kidney and caecal tonsils for PCR testing. If positive, the samples can be forwarded to OVI, where a specific PCR for H5N8 will be done.

So far, H5N8 has not been reported to cause any disease in humans. This has been supported by the National Institute for Communicable Diseases (NICD), which has been testing workers on affected farms. However, it is still recommended that protective clothing, including masks and goggles, is worn when handling suspect material.

Export of certain poultry products is still possible to some consenting countries. Poultry compartments registered for export were requested to provide negative serology results for HPAI on samples collected after the start of the outbreak (22 June) and to continue with monthly testing. The frequency of testing has been increased from six-monthly.

Western Cape has investigated a few reports of increased chicken mortalities. The causes have so far included Newcastle disease and suspected overheating. A map of all known poultry and ostrich locations in the province has also been compiled (fig 2), to help identify high risk areas and to assist with surveillance in the event of an outbreak.

From the literature: H5N8 in an ostrich in South Korea

H5N8 was reported in one nine-week-old ostrich in South Korea in 2014. It died on a farm that contained 50 other ostriches of varying ages, 500m from a duck farm infected with HPAI H5N8. None of the other ostriches showed any clinical signs but the affected bird showed anorexia, depression and nervous signs.

On post mortem, a reddened pancreas, enlarged and haemorrhaged spleen, friable brain and severe hydropericardium were found. The trachea, kidney and caecal tonsils were collected for virus isolation & sequencing and various organs were examined histologically and with immunohistochemistry. Immunohistochemistry detected virus in the brain, in necrotic lesions in the spleen and pancreas, lungs, liver, heart, trachea, Peyer’s patches and kidney.

Eight more blood samples and 25 faecal samples were collected from the other ostriches before they were culled but no more antibodies or viral antigen were detected

References
### Outbreak events

- Four cases of **avian influenza** in the Oudtshoorn/Calitzdorp area were detected in June:
  - An **ostrich** farm near Oudtshoorn tested serologically positive for avian influenza. Some conjunctivitis was seen in several ostriches, but this may be as a result of dust in the camps.
  - A second **ostrich** farm near Calitzdorp tested low positive on avian influenza matrix gene PCR. No clinical signs or unusual mortalities were seen amongst the ostriches.
  - **Wild bird** droppings were collected from several dams in the Calitzdorp area surrounding a currently positive ostrich farm that is under quarantine. Positive test results were obtained on PCR for avian influenza matrix gene from one of the swab pools.
  - A wild **rock pigeon** shot in the Oudtshoorn area tested positive for avian influenza matrix gene on PCR.
- **Ostrich** chicks on a farm near Beaufort West tested serologically positive for **avian influenza**. Test results indicate that this is likely to be as a result of an H6 infection.
- Five month old **ostrich** chicks on a farm near Albertinia tested positive on PCR for **Newcastle disease**. These ostriches have not been vaccinated against Newcastle disease and many wild birds are observed on the farm interacting with the ostriches.
- Two joggers in Clanwilliam found a **bat-eared fox**, that appeared to have been hit by a car, lying by the side of the road chewing on a piece of wood. They took the fox to a local animal welfare organization where the staff recognized the signs of **rabies** and euthanased the fox. Laboratory testing confirmed the diagnosis. The joggers are receiving post-exposure prophylaxis.
- **Johne’s disease** was detected on a farm near Rivierdsonderend after the farmer observed emaciation in some **sheep** in his flock.
- Five **chicken** farms in the Malmesbury area tested positive for **Salmonella enteritidis**.
- A farmer in the **Atlantis** area of Cape Town experienced an abortion storm in his herd of **cattle**. Testing of an aborted foetus resulted in **Brucella abortus** type 1 being cultured. The herd had never been vaccinated against brucellosis, but an excellent calving rate with no abortions was experience in previous years. The source of the infection is likely to be cattle from neighbouring land which break onto his farm frequently owing to fence-theft. Cattle on the surrounding lands will be tested by veterinary officials to identify other positive herds in the area.
- Rams on a **sheep** farm near **Merweville** tested positive for **Brucella ovis**.
- A young **bull** near **Klawer** died of a severe **tick infestation** after being moved to an area where rain had occurred. The bull was emaciated and severely anaemic (fig 3).

![Figure 3: Severe tick infestation and anaemia, resulting in pale mucous membranes (photos: Jacques Kotze)](image)

**Disclaimer:** This report is published on a monthly basis for the purpose of providing up-to-date information regarding epidemiology of animal diseases in the Western Cape Province. Much of the information is therefore preliminary and should not be cited/utilised for publication.

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