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High pathogenicity avian influenza virus detections in ruminants in the USA

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On 18 March, the USA reported an outbreak of clade 2.3.4.4b high pathogenicity avian influenza (HPAI) H5N1 in goats to the World Organisation for Animal Health (WOAH). On 25 March, the US Department of Agriculture also released a statement about HPAI virus having been detected in unpasteurised milk and an oropharyngeal swab from dairy cattle (Fig. 1). This follows reports of HPAI (H5N1) in 232 other mammals in the USA since March 2022, but all were carnivorous or omnivorous species believed likely to have eaten an infected bird. There is also no definitive evidence of mammal-to-mammal transmission in the country. The sole human case of clade 2.3.4.4b H5N1 diagnosed in the USA so far was in 2022. It was someone involved with culling infected poultry, who reported only fatigue and did not require treatment. HPAI virus had never before been detected in a domestic ruminant in the USA.

The outbreak in goats started on 24 February on a backyard property in Minnesota that had recently had an HPAI outbreak in ducks and chickens. The WOAH report states that new-born goats showed neurological signs and ten died in a flock of 165 animals. Virus was detected in brain and other tissues from five kids between the ages of seven and nine days, which provides convincing evidence that the virus was the major cause of disease. The kids were born soon after the property had been depopulated of domestic birds and the goats had shared a water source with the birds. The virus from the goats was also found to be very similar to the virus detected in the birds.

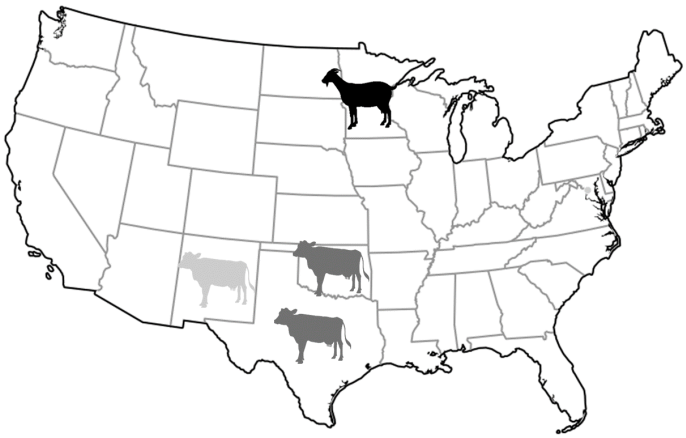

Figure 1: Map of the USA showing states with confirmed HPAI in goats (black), positive HPAI samples from dairy cows (dark grey) and cows with similar clinical signs (pale grey)

The HPAI detections on dairy farms followed investigations into dramatic drops in milk production and reduced feed consumption, mostly in older cows, in Texas, New Mexico and Kansas. Approximately 10% of each herd was affected and a statement from the Texas Department of Agriculture also reported cows are affected for 7 to 10 days. They are febrile and produce thick, discoloured milk. Testing for HPAI virus was done after some farmers reported dead wild birds. Two farms in Kansas had HPAI virus-positive milk and two in Texas tested positive, one on milk and one from an oropharyngeal swab. Further investigation, sampling and genetic analysis will be needed to provide a full picture and estimation of further risk, and presumably before a report to the WOAH can be made. The American Veterinary Medical Association rightly states, "While it is too early to conclude that HPAI is responsible for illness in all of the affected dairy cattle, this finding marks important progress toward confirming a cause".

Influenza A viruses have been associated with bovine respiratory disease and decreased milk yield, through the study of antibodies, but there is little evidence of natural infection with avian influenza viruses, let alone HPAI viruses. There are results of experimental studies where pandemic viruses (human H3N8 in 1977 and an H5N1 from a cat in 2008) were sprayed into the noses of calves. No clinical signs were observed with the H3N8 viruses, though the calves did seroconvert, so must have been infected. Similar results were observed with the H5N1 virus and there was also evidence that virus may have transmitted from the inoculated calves to a contact calf kept with them but not inoculated.

Infection of ruminants with HPAI viruses is therefore possible and could have serious effects. However, much more information will be required before we can accurately estimate the risk to our herds. It is possible that subclinical infections are already widespread, but are not being detected due to lack of indication for testing. It is also possible that only certain viruses will be infectious for ruminants or that high doses, under specific circumstances, will be necessary to cause disease. For the moment, it is advisable that ruminants should not have access to dams or open water where sick or dead wild birds have been observed.

References:

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High pathogenicity avian influenza reaches Antarctica

HPAI was confirmed to have reached the mainland of Antarctica after being detected on islands in the Sub-Antarctic region several months ago. In October 2023, HPAI (H5N1) was detected in seabirds and marine mammals on the island of South Georgia. By the end of January 2024, at least 200 gentoo penguins (Fig. 2) had died from HPAI in the Falkland Islands and the virus was also detected in gentoo and king penguins on South Georgia. At least 50 wandering albatrosses also died on South Georgia early in 2024 and other procellariiform species affected in the region include southern fulmar and black-browed albatross in the Falklands. In February 2024, A Spanish-led research team confirmed H5 HPAI in samples taken from dead skuas at Primavera Station on the northern end of the Antarctic peninsula. Detections of HPAI in the Antarctic region are being recorded by the Sub-Antarctic and Antarctic highly pathogenic avian influenza H5N1 monitoring project, accessible at https://scar.org/library-data/avian-flu.

Figure 2: Gentoo penguins (Photo: B. Hart)

Outbreak events

New outbreaks of **African swine fever** (ASF) were reported from **George**, **Knysna** and **Plettenberg Bay**. All affected locations were areas in which many small-scale farmers keep livestock in close proximity to each other, with few biosecurity measures in place. Free-roaming pigs were observed and farmers reported feeding uncooked swill to their pigs. The outbreaks were detected when farmers reported deaths of pigs after showing loss of appetite and redness of the skin (Fig. 3). Necropsies showed haemorrhages on the internal organs and lymph nodes (Fig. 4). ASF was confirmed by PCR testing of organ samples taken. All three areas were placed under quarantine and farmers were informed about biosecurity and carcass disposal. Lime was distributed to aid with disinfection.

Sheep scab was detected on a farm in the **Caledon** area after scratching, biting and skin lesions were seen in the sheep. Based on the size of the lesions, it is suspected that the infestation was brought onto the farm in September when the sheep were sheared. Another infestation of sheep scab was detected on the neighbouring farm of a previously infected farm in the **Three Sisters** area. Both affected farms were placed under quarantine and the sheep will be treated under official supervision.

***Salmonella* Enteritidis** was isolated from chick crates and dead-in-shell chicks on three commercial **broiler** farms in the **Worcester** and **Malmesbury** areas.

Figure 3: Pigs that died of African swine fever near George showed red patches of skin on their undersides (Photo: L. Janse van Rensburg)

Figure 4: Haemorrhagic lymph node from a pig that died of African swine fever near George (Photo: L. Janse van Rensburg)

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