

Preliminary Outbreak Assessment

Influenza A (H5N1) of Avian origin in domestic livestock in the United States of America

25 April 2024

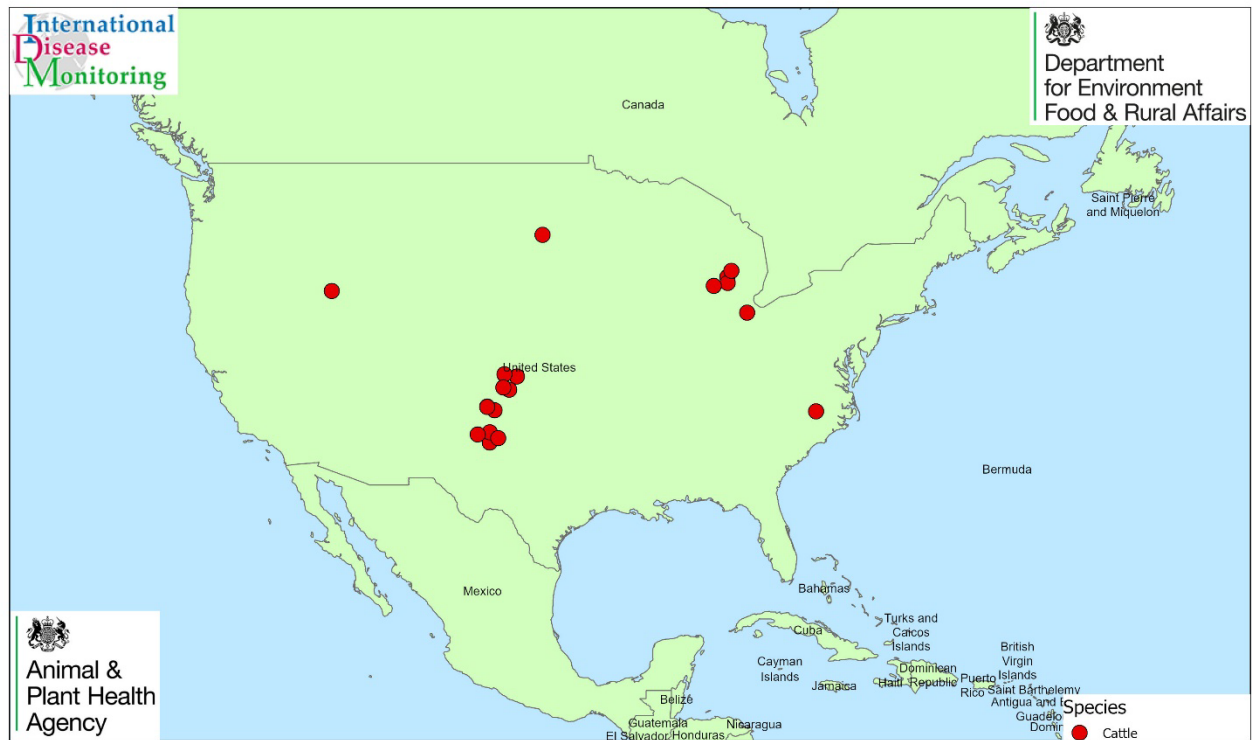
Disease report

On 26 March 2024, the United States of America (USA) made an immediate notification to the World Organisation for Animal Health (WOAH) of an outbreak of Influenza A (H5N1) of avian origin (Influenza A (H5N1)) affecting dairy cattle in Texas. Milk samples and oropharyngeal swabs tested positive for viral RNA after cows showed clinical signs including decreased lactation, thickened discoloured milk, fever, and low appetite. The material detected has been sequenced and shown to belong to clade 2.3.4.4b strain B3.13, a viral reassortant between Eurasian High Pathogenicity Avian Influenza (HPAI) H5N1 and North American Low Pathogenicity Avian Influenza (LPAI) strains. This strain has not been detected in the UK, and none of the viruses detected in the UK over the 2020 to 2024 HPAI outbreak period have contained genetic material originating from North or South American viruses.

Additional testing of cattle was carried out on farms where clinical signs have been observed, with deceased wild birds noted on the Texas farm, and since then, and as of 24 April 2024, there have been 32 further reports of Influenza A(H5N1) in dairy cattle in 8 states ([USDA](#)). There have also been further reports of the same strain in domestic and wild mammals, including 6 cats showing signs of neurological illness in dairy farm settings where the cattle were also positive (at least 3 of which were reported to have died) and a skunk in North America. There has been one infection in a person exposed to infected dairy cattle, who showed symptoms of conjunctivitis prior to recovery following isolation and anti-viral treatment.

The risk to **GB** of H5N1 in livestock is assessed at **very low**.

Map 1. Influenza A (H5N1) outbreaks and cases cattle in the Americas, note these locations are approximate.



Map Prepared by IDM
 Date: 26/04/2024
 Absolute Scale: 1:40,000,000

**Influenza A (H5N1) of avian origin in cattle
 January 2024 to April 2024. (WOAH Data Only)**

0 660 1,320 1,980 Km

Situation assessment

The U.S. Department of Agriculture (USDA) first confirmed HPAI H5N1 virus in a commercial poultry flock in February 2022 (WOAH). Since February 2022 the USA has reported and responded to over 1,100 detections on poultry farms. Since late March 2024 the USDA, Food and Drug Administration (FDA), Centers for Disease Control and Prevention (CDCP), state veterinary and public health officials and the National Animal Health Laboratory Network (NAHLN) have been working together to investigate the emergence of Influenza A(H5N1) of avian origin in dairy cows in a rapidly evolving environment with many knowledge gaps.

Since the first detection of H5N1 in cattle in Texas, there have been 32 more detections across the USA in Kansas, New Mexico, North Carolina, Idaho, South Dakota, Ohio and Michigan. The strain of the virus found in all the positive dairy cattle in other States is almost identical to the strain initially confirmed in cattle in Texas and Kansas that appears to have been introduced by wild birds (H5N1, Eurasian lineage goose/Guangdong clade 2.3.4.4b strain B3.13).

The USDA has also confirmed - based on specific phylogenetic evidence and epidemiological information - that 8 poultry premises in 5 states (Kansas, Michigan,

Minnesota, New Mexico and Texas) have also been infected with the same HPAI H5N1 virus genotype detected in dairy cattle. The basis for these poultry detections remains unclear and further information and metadata is required to understand the epidemiological significance of these observations. Additionally, the Animal and Plant Health Inspection Services' (APHIS') National Veterinary Services Laboratories found HPAI in a lung tissue sample from a cull dairy cow with no clinical signs that originated from an affected herd and which did not enter the food supply ([APHIS](#)). While the original source of the virus in cattle is thought to be from infected wild birds, further cases in new areas are thought to have occurred as a result of cattle movements between herds.

On 16 April 2024, the USDA confirmed that cow to cow transmission is a factor for the virus spreading, with spread identified between cows in the same herd, spread between dairies with associated cattle movements, and cows without overt clinical signs testing positive ([USDA, April 2024](#)). Mechanical transmission is considered to be the most likely mechanism (rather than direct or aerosol contact), and introduction pathways such as fomites on equipment or contaminated feed, water, or bedding cannot be ruled out.

In the US, the feeding of broiler litter to cattle is permitted and presently, no federal laws or regulations control the sale or use of broiler litter as a feed ingredient. Also, no state laws specifically regulate the feeding of animal waste and other by-products. However, several states have regulations that govern sales through commercial markets of these products intended as a feed ingredient.

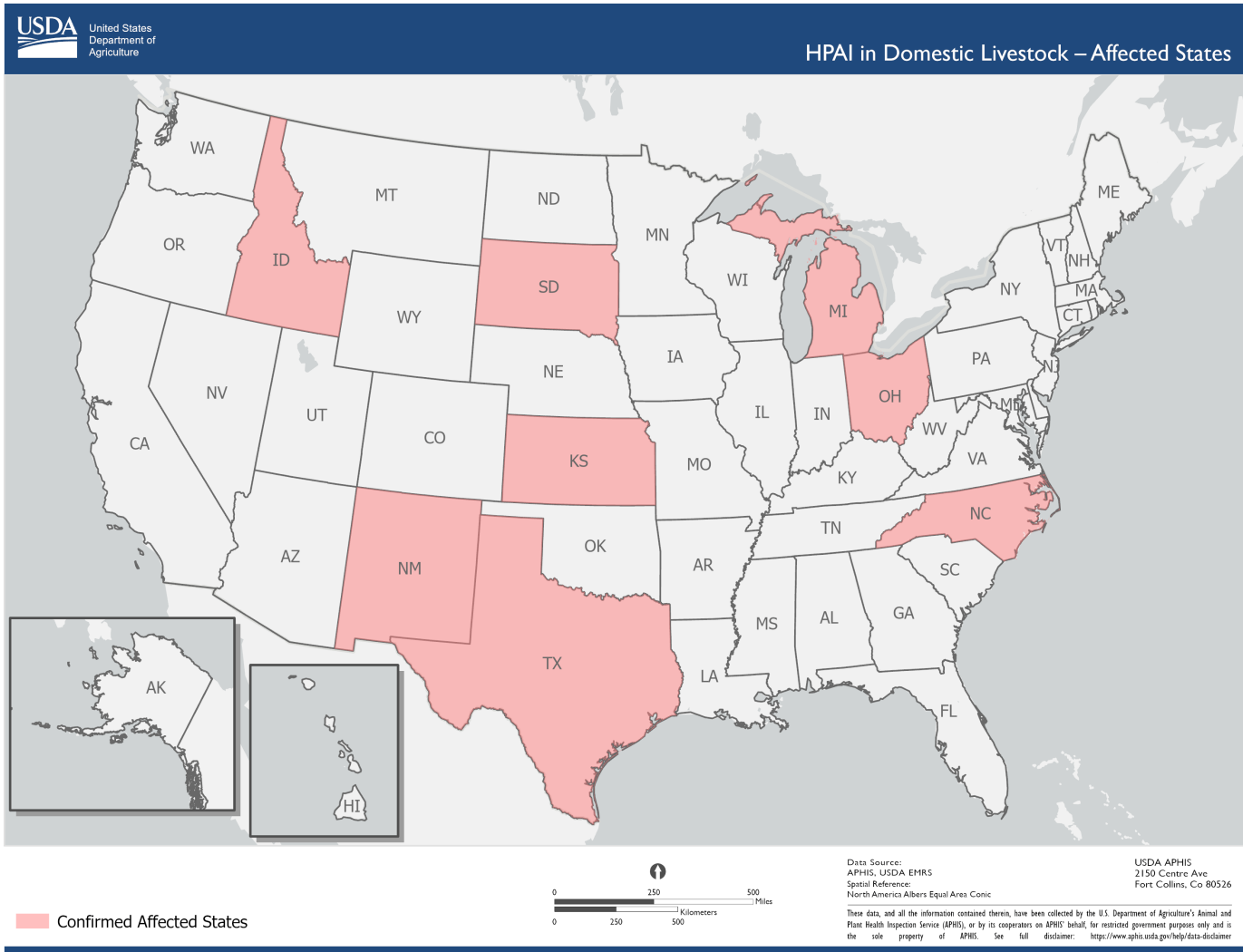
HPAI is notifiable in mammals in the USA and, on 24 April 2024, the USDA announced a [Federal Order](#) requiring testing for and reporting of HPAI in livestock. The order highlighted that the interstate movement of HPAI infected animals is already prohibited, and the detection of this distinct H5N1 virus genotype in cattle poses a new animal disease risk to cattle as well as an increased risk to poultry. In order to monitor the current situation and mitigate against further disease spread, the Federal Order announced control measures to be implemented, effective from 29 April 2024. Firstly, there is to be mandatory pre-movement testing for interstate movement of dairy cattle at a National Animal Health Laboratory Network (NAHLN) approved laboratory. APHIS will provide reimbursement for NAHLN approved testing for those tested due to clinical suspicion of disease, pre-movement testing, producers who have an interest in the disease status of their asymptomatic animals, and samples identified as part of tracing activities. Secondly, the Federal Order announced mandatory reporting from laboratories and state veterinarians of positive Influenza A nucleic acid detection results and positive Influenza A serology diagnostic results in livestock to USDA APHIS. A case definition has also been provided ([hpa-livestock-case-definition.pdf \(usda.gov\)](#)).

In a further effort to maximise understanding in a rapidly evolving situation, APHIS have made whole genome sequence data from 239 US H5N1 clade 2.3.4.4b virus samples [publicly available](#), and are urging farmers to share epidemiological information from affected farms.

On 23 April, the FDA provided an [update on the Federal-State milk safety system](#) and emphasised that current literature suggests the commercial milk supply is safe due to the

pasteurisation process, though viral fragments could remain ([Updates on Highly Pathogenic Avian Influenza \(HPAI\) | FDA](#)). No studies on the effects of pasteurisation on HPAI H5N1 in bovine milk have previously been conducted. The US government partners are also working to deliver on a range of studies on milk at all stages of production, with results to be shared in the next few days to weeks.

Map of the US states where cattle infected with HPAI H5N1 have been detected ([High Pathogenicity Avian Influenza \(HPAI\) Detections in Livestock | Animal and Plant Health Inspection Service \(usda.gov\)](https://www.usda.gov/aphis/npn/animal-plant-health/animal-plant-health-inspection-service))



Implications for GB

Since the start of the current global avian influenza outbreak in 2021, in Great Britain and across the world, HPAI H5N1 has been detected in multiple wild mammals and some domestic mammal species ([WOAH](#)). The recent emergence of H5N1 in previously healthy dairy cattle in the USA is a new development, to be updated as more information becomes available.

The emergence of a strain of H5N1 capable of infecting cattle, or any other domestic mammal, is thought to be a rare event, which is made even less likely by implementing biosecurity practices and disease control measures. The full genome of the virus affecting cattle has been made publicly available, and the virus is different to, and distinguishable from, H5N1 that has been circulating in Great Britain and Europe. This is also the case for other H5N1 viruses circulating in poultry and wild birds in North America since they have been evolving independently from European viruses since 2022. Therefore, the likelihood of the same sequence of events occurring in Great Britain resulting in an identical virus emerging in cattle is highly improbable. While a similar event could be possible with a UK virus adapting to more mammalian livestock species, this would still be very rare, and would likely require a high initial introductory dose as well as close proximity between mammalian livestock and poultry. Whole Genome Sequencing (WGS) of H5N1 viruses detected on poultry farms in Great Britain has taken place throughout the HPAI H5 epizootic and pigs present on the same premises as poultry outbreaks have been sampled for avian influenza (with negative results). The avian influenza surveillance carried out to date in Great Britain gives a very high level of confidence that this strain has not been detected in Great Britain.

The most likely routes of entry of this American H5N1 virus into Great Britain are via trade in bovine products from affected farms in the USA, or by migratory wild birds. There is no trade in live cattle. There are no wild birds that migrate to north-western Europe directly from North America. During August migrations birds can get blown off course and end up in the Atlantic and western UK however these instances are considered rare. HPAI has been translocated to North America from Europe on at least two occasions over the last two years by infected migratory wild birds from Europe mixing with migratory birds from North America in Greenland. This is a plausible route of reintroduction of H5N1 from North America to Great Britain, however there is no evidence that this has occurred based on genomic analysis of outbreaks in Great Britain. Additionally, detections of HPAI H5N1 in poultry in the USA and Canada have slowed, with 26 poultry premises affected in 2024, as of 15 April, compared to 165 detections in the same time period in 2022. It is considered that the risk of introduction through wild birds is **very low**.

The USA is approved for the import of raw milk and products as they are listed in column A of the Third Country list. The H5N1 virus affecting dairy herds in the USA has been shown to be shed in milk in high concentrations, and so contact with unpasteurised milk may spread the virus. The process of pasteurisation inactivates bacteria and viruses, though there have not been previous studies conducted on the effects of pasteurisation on HPAI

H5N1 in bovine milk and studies regarding the situation in the USA are ongoing. Therefore, there could be a route of entry to Great Britain of virus through unpasteurised dairy products imported from affected farms in the USA, although the vast majority of dairy products from the USA are pasteurised, such as cheese and whey, along with smaller amounts of yogurt, condensed milk and dairy spreads.

From 1 January 2023 to 24 April 2024, 27 tonnes of pasteurised or sterilised dairy products were imported to Great Britain from the USA across 77 consignments. Of this, approximately 14 tonnes consisted of whey products and 12 tonnes of pasteurised cheese. Two consignments, totalling less than 45kg, of unpasteurised cheese were imported in June 2023. No consignments of raw or unpasteurised milk have been imported from the USA since the start of 2023.

From 1 January 2023 to 24 April 2024, 130.7 tonnes of fresh bovine meat were imported to Great Britain from the USA across 45 consignments. Fifteen consignments, totalling 37.7 tonnes, were received in the last 3 months. There is currently no evidence of HPAI H5N1 surviving in the meat of cattle. A total of 16 consignments, totalling less than 4 tonnes of colostrum were imported from the start of 2023, approximately 75% of this was for human consumption.

To date, no actions have been implemented to restrict any imports of products of animal origin (POAO) from the USA to GB, however, the situation is being monitored by the UK Office for SPS Trade Assurance and restrictions will be implemented where necessary. The [FDA](#) released an update that acknowledged some samples of pasteurised milk had indicated the presence of viral particles of HPAI, but stressed that though pasteurisation is likely to inactivate the virus, the process is not expected to remove viral particles.

Though it is common practice in many parts of the world (including the USA) to use litter as feed, that is not the case in GB and as such does not represent a risk. Use as bedding is not a permitted use of manure under ABP legislation in GB, unprocessed manure is prohibited from being imported under the ABP Regulations, and the import of processed manure would need to comply in full with the specific import requirements, using the processed manure health certificate [GBHC550](#).

HPAI H5N1 can be transmitted via fomites on contaminated equipment, vehicles and people, but it is considered a highly unlikely route that any contaminated equipment (such as milking equipment) is entering and being utilised on farms in Great Britain.

Conclusion

Available trade data shows that only a small proportion of consignments of dairy products could contain H5N1 virus, and given the low prevalence of disease in dairy cattle in the USA so far, it is very unlikely that these would come from infected farms. Additionally, the mitigation measures that are currently in place in the USA, along with the mandatory testing and reporting that are soon to be implemented will reduce this likelihood further. Migratory birds could be a plausible route of introduction of H5N1 virus affecting dairy

cattle to Great Britain, although not directly and would be considered rare events. Therefore, the risk of entry of H5N1 virus capable of infecting domestic livestock is **very low**. We will continue to monitor the situation as it evolves.

There are always concerns around infected products entering the UK in passenger luggage and the subsequent waste being discarded in areas where livestock or wildlife could access them. We would like to highlight to all cattle keepers, dairy producers, smallholders and general public that it is illegal to feed cattle catering waste, kitchen scraps or dairy products, and to adhere to the swill feeding ban. All dairy keepers should remain vigilant and ensure that any visitors to their premises have not had any recent contact with dairy cattle or cattle premises in the affected regions. People who have been working on farms or with animals returning from any affected areas should avoid any contact with domestic cattle or domestic poultry in commercial holdings and smallholdings. All clothing, footwear or equipment should be disinfected before entering dairy cattle or other livestock areas.

Any suspect cases must be reported promptly. If you suspect a notifiable disease in your animals, you must report it immediately by calling the Defra Rural Services Helpline on 03000 200 301. In Wales, call 0300 303 8268. In Scotland, contact your local Field Services Office. Failure to do so is an offence. We will continue to monitor the situation.

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All outbreaks and cases were taken from the World Organisation for Animal Health (WOAH).

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