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## WASTEWATER TESTING FOR H5N1 AVIAN INFLUENZA VIRUS COULD PROVIDE EARLY WARNING AND INFORMATION ABOUT OUTBREAKS

**A**mid uncertainty regarding the spread of **H5N1 avian influenza** in dairy cattle and its transmission to humans, wastewater testing is emerging as an important surveillance tool. Significant levels of H5N1 influenza were identified at three treatment plants in communities where H5N1 was detected in cattle.

In other developments, a dairy industry specialist from the University of Michigan reported an outbreak at a farm where symptoms in cows were more severe than previously described, highlighting the challenges faced by farmers.

Findings from two partnering university centers (the "Waterscan" project initiated by Stanford University and Emory University) come amid other efforts to track the virus's spread in **wastewater**. The Centers for Disease Control and Prevention (CDC) has launched its own wastewater surveillance mechanism, which tracks influenza A, including H5N1.

Furthermore, researchers in Texas recently found H5N1 virus sequences in wastewater in 9 out of 10 sampled cities.

By patenting a method for sampling H5, the "Wastewater SCAN" team found significant levels of H5 and influenza A through retrospective analysis of wastewater samples from treatment plants in communities near H5N1 **outbreaks** in dairy cattle (three in Texas and one in North Carolina). For comparison, samples from the same period in Hawaii were examined.

Increases in H5 and influenza A levels were recorded just before and during confirmed H5N1 outbreaks in Texas dairy cattle. Retrospective tests showed H5 was present on February 25, a week before an unspecified illness was reported in Texas cattle.

Discharging **residues** from dairy processing into the sewage system leads to H5 detection in wastewater. The H5 source in wastewater can also come from other animal species or humans. Although tests cannot identify the species shedding the H5 virus, data correlation with Texas emergency services suggested that the virus did not come from a human source.

The state of Michigan reported 18 outbreaks in nine counties, the most of any state. Interviewing a farmer estimated that severe symptoms in cows have a significant financial impact, between approximately \$30,000 and \$40,000 per outbreak, considering **veterinary** care, affected labor, loss of milk, and calves.

An initial outbreak, which took 15 days to clean up at a 500-cow farm, started in a barn with two pens and three water wells, including a **common** one in the center. The first signs of illness in cattle were elevated body temperatures lasting about two days, leading to severe dehydration. Some cows aborted their calves, likely due to fever.

Farm workers, who remained healthy, tried to contain the outbreak in the barn by changing the wash cycle after milking affected cows, but the virus spread to all lactating cattle on the farm.

Wastewater monitoring can provide an early warning about outbreaks that could impact other geographic areas, even those not associated with human populations, including generating animal outbreaks with zoonotic potential.

*Adapted after Lisa Schnirring, 21 May 2024*

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