

Policy Background: Monitoring Possible Public Health Threats: Bird Flu: *H5N1 Spreads to Pigs*

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Key Insights

This Policy Background serves as an update to CED's [Policy Background: Bird Flu Outbreak: H5N1 Spreads to Cattle](#), released in May, which discussed the transmission of bird flu to cattle and dairy workers, demonstrating the virus's ability to transmit between mammalian species. For the first time in this outbreak, the virus has been detected in pigs: on October 30 the USDA [announced](#) an ongoing investigation of an Oregon backyard farming operation that had a mix of poultry and livestock, including swine. While the public health risk remains low, the US Centers for Disease Control (CDC) is monitoring the situation carefully and working with states to monitor animal and human exposure.

- The spread of H5N1 to pigs is significant because of pig species' role as viral "[mixing vessels](#)," as swine can be infected with both bird flu viruses and human flu viruses. This phenomenon, known as reassortment, gave rise to the 2009 H1N1 pandemic.
- H5N1 virus isolated from a Canadian teen in critical condition shows signs of mutation for [human adaptation](#). The Vancouver teen, who was hospitalized with acute respiratory distress syndrome (ARDS), was Canada's first recorded human case of the virus.
- H5N1 was also [detected](#) in Los Angeles County wastewater on October 28. The virus was also detected last week in other counties throughout the state and is assumed to be the result of discarded contaminated animal products.
- The threat of human-to-human transmission remains low for now but surveillance, including rules on interstate transmission of some cattle, will continue.

Bird Flu Transmits to Pigs

H5N1 bird flu, which the CDC describes as "[widespread](#)," has been devastating wild bird, commercial poultry, and backyard flocks since January 2022. Bird flu is highly contagious and deadly in birds, with [mortality rates](#) between 90 and 100 percent. During outbreaks, farmers are supposed to report the incident to USDA officials, and in response, USDA officials visit the farm to cull the entire flock. "Table egg-layer facilities tend to be very large, and so you can lose a million or 2 million birds on a single facility, because this is a highly contagious virus," said Amy Hagerman, Associate Professor of Agricultural Economics at Oklahoma State University. The most recent major [spike in cases](#) occurred in July, when approximately 3 million laying hens were culled in Colorado, depopulating more than half of the state's total inventory of laying hens, according to Colorado State Veterinarian Maggie Baldwin. Over [108 million birds](#) have died since the start of the outbreak, one of several factors that have led to an increase in the price of eggs. A dozen large grade A eggs [cost](#) an average of \$3.37 in October 2024, the most recent data available, up from \$2.52 in January of this year. Higher consumer demand is another major factor contributing to higher costs for consumers.

The Oregon Department of Agriculture announced on October 25 that poultry on a backyard farming operation were sick with bird flu, marking the [first H5N1 detection](#) in Crook County, Oregon. Later, on October 29, the USDA National Veterinary Services Laboratories (NVSL) also confirmed one of the farm's five pigs as infected with the virus, marking the first detection of H5N1 in swine in the US. "The livestock and poultry on this farm shared water sources, housing, and equipment; in other states, this combination has enabled transmission between species," said the [press release](#) by USDA's Animal and Plant Health Inspection Service (APHIS). The farm has been quarantined to prevent further spread of the virus and remains under surveillance. Fortunately, however, genomic sequencing performed by NVSL of virus from poultry infected on this farm showed no changes to the H5N1 virus that would suggest to USDA and CDC that it is more transmissible to humans.

As with cattle earlier this year, transmission of bird flu to other species occurs with some regularity. For instance, dozens of captive lions and tigers died in September of H5N1 in [southern Vietnam](#). In Long An Province, 27 tigers and three lions died between September 6 and 18 were they were kept at a resort. The tigers were fed chicken before they died, with infected poultry likely the source of infection. Unlike in [2004](#), H5N1 bird flu appears not to have spread to pigs in Asia thus far, or it has not been reported to authorities or the World Health Organization.

Pigs as Viral "Mixing Vessels" Pose Major Public Health Risk

The spread of H5N1 to pigs in particular has US public health officials on high alert because swine are considered "[mixing vessels](#)" for flu viruses because the species can be infected with both bird flu viruses and human flu viruses. If the pig is coinfecting with both virus types, the viruses can swap genes, potentially forming a hybrid virus more capable of spreading to and among humans. This phenomenon, known as reassortment, gave rise to the 2009 H1N1 pandemic. "If it [H5N1] doesn't spread from pigs to pigs and it just happened on that one farm, it's not a big deal. If it starts to spread from pigs to pigs, then it's much more of a problem," said Florian Krammer, a flu virologist at Mount Sinai's Icahn School of Medicine in New York. "If it ends up in large pig populations in the US similar to cows, I think this would be a disaster," said Krammer.

The CDC has confirmed [53 human cases](#) of H5N1 this year, with the majority of cases found in California, Washington State, and Colorado. Five of the 27 cases [discovered in California](#) were confirmed on November 13 and 14, with all cases occurring in dairy workers on affected farms. All available data thus far demonstrate sporadic instances of animal-to-human spread. All the workers demonstrated only minor symptoms, and none was hospitalized. Since H5N1 was first reported in dairy cows in March, 550 dairy herds have been [affected](#) across 15 states, with 215 new confirmed cases in the last 30 days.

A Canadian teenager was [hospitalized](#) with H5N1 in the country's first known human case of the virus. The Vancouver teen's initial symptoms included conjunctivitis, fever, and cough, and eventually progressed to ARDS, requiring hospitalization on November 8. As of November 19, the child remains in critical condition at the British Columbia children's hospital. The [strain of the virus](#) sickening the teen differs from the strain that is transmitting in dairy cattle in the US and is more closely related to an H5N1 strain that is circulating in wild birds in the Pacific Northwest.

Preliminary sequencing of the H5N1 variant found in the Canadian teenager showed a [potential mutation](#) on the genomic spot known to make humans increasingly susceptible. This finding could indicate that H5N1 has already evolved to more closely resemble a human virus, but it is not clear yet whether this change is significant, as another possibility is that the virus mutated over the course of the teen's illness. "It's not quite clear what the real-world implications are going to be, but certainly all of these things are a warning sign," said Angela Rasmussen, a virologist at the Vaccine and Infectious Disease Organization at the University of Saskatchewan. "We really do need to pay attention to this, and we really do need to try to reduce more human infections as much as we possibly can."

Containment Efforts and Industry Pushback

USDA's APHIS [announced](#) on October 30 that the agency plans to enhance its testing and monitoring for H5N1 by collecting milk samples to better assess the presence of the virus and improve biosecurity and containment measures. The agency stated that "USDA plans to first sample milk in bulk at the regional level, with additional testing at the farm level if necessary, until herds in an area are determined to be free of the virus." Colorado, which has confirmed a [total of 64 cases](#) in dairy herds since the start of the outbreak, implemented statewide bulk milk testing after the virus was detected in two counties. The process is thought to be successful in mitigating the spread of the virus, as the state has not reported a new case of H5N1 since mid-August.

USDA's move to test bulk raw milk comes after livestock and veterinary groups pushed the agency to strengthen its [virus surveillance](#). "These situations evolve over time and as they evolve over time there needs to be a recalibration and adjustment," said Agriculture Secretary Tom Vilsack. The effort follows an emergency order issued in April to require dairy cows to secure a negative bird flu test no more than seven days prior to interstate movement. The order allows non-dairy producing cattle to cross state lines without testing. However, the USDA softened its initial rules, which included a three-day testing timeframe, following [pushback](#) from state officials and industry representatives. "The 72-hour pre-movement time frame we have heard is being contemplated is simply not accomplishable," wrote Chelsea Good, Vice President of Government and Industry Affairs at the Livestock Marketing Association, in an industry memo to USDA officials. Others from the dairy industry have expressed concerns that the requirement of veterinary documents is a financial strain for dairies operating on slim margins. For their part, veterinary groups have noted that ideally, testing should occur within 12 hours of travel.

Conclusion

The spread of H5N1 to swine raises public health alarm because the species acts as an ideal genetic mixing vessel to [generate](#) a human epidemic or pandemic influenza strain, as swine have respiratory receptors to which both avian and flu viruses can bind. So long as it remains isolated, the case of H5N1 on the Oregon hobby farm does not pose an immediate public health threat, but if the virus were to enter commercial pig facilities, it could easily spread unchecked and pose a far greater risk of human-to-human transmission. While the current risk to the public from H5N1 remains low, heightened surveillance by CDC for mutations highlights a principal lesson of the COVID-19 pandemic: the importance of surveillance and preparedness to mitigate the health and economic effects of future pandemics.

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