The Healthy Herd Series: HPAI H5N1 Found in Backyard Swine

Kaylyn Rudy, SDSU Extension Swine Field Specialist
Rafe Royall, Assistant Professor & SDSU Extension Swine Specialist
Bob Thaler, Farm Credit Services of America Endowed Chair in Swine Production, Distinguished Professor & SDSU Extension Swine Specialist
Russ Daly, Professor, SDSU Extension Veterinarian, State Public Health Veterinarian

June 2025

Highly Pathogenic Avian Influenza (HPAI) H5N1 has been circulating in the news since 2024, but what is it and what does this mean for pork producers and their families? The HPAI H5N1 is one subtype of many Avian Influenza Viruses and as the name implies, this specific subtype of H5N1 is considered to be a highly pathogenic strain (Yin et al., 2013). However, it is considered by the CDC to be low risk to humans. HPAI H5N1 is spread in part by the migration of wild birds, and outbreaks of this virus date back to 1996 in Guangdong, China (Yin et al., 2013). This virus is not new to the United States. In 2021 HPAI H5N1 spread from Europe to North America, by 2022 it had spread to South America and in March of 2024 it was found not only in birds but in dairy cattle in the U.S.(NIH, 2014, Ison and Marrazzo, 2024). In order for the virus to infect not only birds but mammals, the virus must experience adaptations or mutations that permit transmission (Yin et al., 2013, Vandegrift et al., 2010). In the case of human infection, it is generally a result of close contact with infected birds (Yin et al., 2013) and more recently dairy cattle (NIH, 2014).

Unfortunately, there has been a confirmed case of H5N1 in swine. According to a press release from the USDA, a positive case of HPAI H5N1 was found in swine on a backyard farm, in Oregon in October of 2024. The initial call was made to the Oregon Department of Agriculture from a homestead type farm, regarding sick birds on the property who had developed neurological symptoms and died, these included ducks, a goose, and peacocks. The farm had a mix of livestock and poultry, including three kunekune pigs and two teacup mini pigs. It was noted that the pigs shared a water source with the various poultry and the mini pigs shared housing with the chickens. Despite the pigs not showing signs of illness, out of precaution the USDA tested them due to shared water source and housing which has been known to enable disease transmission. In the update provided in November, the USDA confirmed that two pigs were positive for HPAI H5N1, while the additional three tested negative. The USDA stated that this is the first detection of HPAI H5N1 found in swine in the United States. Since this is a small backyard operation and not a commercial facility, the USDA stated in their press release that,

"There is no concern about the safety of the nation's pork supply as a result of this finding".

Additionally, after sequencing the virus from the infected poultry, the USDA's National Veterinary Services Laboratory has not found any changes to the H5N1 virus that would make it more transmissible to humans and believe that there is a probability that the pigs and

poultry became infected from migratory birds due to the similarities found via genome sequencing.

Dr. Ryan Scholz, a State veterinarian for Oregon, spoke on H5N1, its relationship with swine, and a deeper look into the case in Oregon. Dr. Scholz stated that swine exhibits a broad susceptibility to influenza A strains and that upper respiratory diseases commonly come from the H1N1, H1N2, and H3N2 strains. The risk posed by swine is co-infection with multiple host adaptive strains. Pigs are of concern due to their susceptibility to human and avian strains.

Symptoms of H5N1 in swine have yet to be seen. The infected swine in Oregon did not show any clinical signs of illness prior to being euthanized. This does not come as a total surprise because a study conducted in 2023 showed pigs experimentally inoculated with HPAI H5N1 clade 2.3.4.4b, showed no clinical signs or fever 14 days postinfection (Graaf et al., 2023). Additionally, when asked about what symptoms to watch for, Dr. Scholz said there isn't an answer at this point since the pigs were asymptomatic. He imagines that there would be a combination of respiratory and neurological symptoms, but as mentioned before, there are no officially documented symptoms to watch for regarding H5N1 in swine. However, there are documented symptoms in both poultry and dairy cattle. If there are poultry on the farm, be aware of symptoms such as sudden death, neurological symptoms, decreased appetite, swelling of the head and eyes, respiratory distress, and nasal discharge (Illinois Department of Agriculture, 2024). Symptoms in dairy cattle include reduced milk production, thickened discolored milk, low appetite, and fever (Swayne, 2024). In humans mild symptoms can include conjunctivitis (eye redness has been the predominate symptom), cough, sore throat, fatigue, muscle aches, runny or stuffy nose, and fever (CDC, 2025).

We now know that while very rare, pigs can get infected with H5N1, but unfortunately there are currently no classic symptoms to look for regarding this specific influenza. However, the biggest take aways for producers from this Oregon case would be to stay vigilant for signs of influenza, such as difficulty breathing, anorexia, coughing, fever, and lethargy. Producers should make sure they implement good biosecurity practices. Biosecurity is pertinent in protecting our livestock and families no matter how big or small a farm is, especially if there are multiple species on a farm. While it may seem unnecessary on a homestead or small family farm to practice good biosecurity, the Oregon case reinforces the point of how important biosecurity is for all livestock operations. The USDA emphasized that biosecurity is the greatest defense against the spread of H5N1 and the data that they have collected shows that H5N1 can be transmitted via equipment, people, and additional items that move between farms including between dairy and poultry facilities (USDA, 2024). To read the complete update on H5N1 found in swine please visit: USDA Animal and Plant Health Inspection Service Shares Update on H5N1 Detection in Oregon Swine, Bovine Vaccine Candidate Progression | Animal and Plant Health Inspection Service.

References

CDC. “Signs and Symptoms of Bird Flu in People.” *Avian Influenza (Bird Flu)*, 17 Jan. 2025, cdc.gov/bird-flu/signs-symptoms/index.html.

Graaf, Annika, et al. “Low Susceptibility of Pigs against Experimental Infection with HPAI Virus H5N1 Clade 2.3.4.4b.” *Emerging Infectious Diseases*, vol. 29, no. 7, 2023, doi.org/10.3201/eid2907.230296.

Illinois Department of Agriculture. “H5N1 Avian Influenza (Avian Flu).” *Illinois Department of Agriculture*, 2024, agr.illinois.gov/animals/animalhealth/poultry/avianflu.html.

Ison, Michael G., and Jeanne Marrazzo. “The Emerging Threat of H5N1 to Human Health.” New *England Journal of Medicine*, Dec. 2024, p. NEJMe2416323, doi.org/10.1056/NEJMe2416323.

“NIH Officials Assess Threat of H5N1.” *National Institutes of Health (NIH)*, 31 Dec. 2024, nih.gov/news-events/news-releases/nih-officials-assess-threat-h5n1.

Swayne, David. *Avian Influenza Virus Type A (H5N1) in U.S. Dairy Cattle | American Veterinary Medical Association*. 2024, avma.org/resources-tools/animal-health-and-welfare/animal-health/avian-influenza/avian-influenza-virus-type-h5n1-us-dairy-cattle.

USDA Animal and Plant Health Inspection Service Shares Update on H5N1 Detection in Oregon Swine, Bovine Vaccine Candidate Progression | Animal and Plant Health Inspection Service. 6 Nov. 2024, aphis.usda.gov/news/agency-announcements/usda-animal-plant-health-inspection-service-shares-update-h5n1-detection.

Vandegrift, Kurt J., et al. “Ecology of Avian Influenza Viruses in a Changing World.” *Annals of the New York Academy of Sciences*, vol. 1195, no. 1, 2010, pp. 113–28, doi.org/10.1111/j.1749-6632.2010.05451.x.

Yin, Jingchuan, et al. “An Overview of the Highly Pathogenic H5N1 Influenza Virus.” *Virologica Sinica*, vol. 28, no. 1, 2013, pp. 3-15, doi.org/10.1007/s12250-013-3294-9.

South Dakota State University Extension

SOUTH DAKOTA STATE UNIVERSITY®
ANIMAL SCIENCE DEPARTMENT

P-00344