

Outbreak investigations of *Actinobacillus pleuropneumoniae* serotype 15 in central Iowa in the winter of 2021-22

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Key Points

- Gaps in biosecurity procedures, such as practices associated with rendering and people entry events, facilitated the lateral transmission of pathogens between sites of different companies.
- Contracted third-party companies created potential for many operational connections between production systems. Communication between production systems about possible connections was generally absent.
- Vet-to-vet communication between companies was an essential step toward rapid response to emerging health challenges, avoiding further spread between sites and companies.

Actinobacillus pleuropneumoniae serotype 15 (APP15) has been infrequently diagnosed since 2010 at the Iowa State University Veterinary Diagnostic Laboratory (ISU-VDL). From 2010 to 2020, only 31 cases submitted from premises within the United States (U.S.) were diagnosed as APP15. From January to October 2021, 11 cases of APP15 were diagnosed. Finally, during 60 days from the end of November 2021 to January 2022, there was an outbreak of 20 cases of APP15. All 20 cases were submitted to the ISU-VDL and were characterized by a sudden increase in mortality. The cases during this latter period were interesting from an epidemiological perspective since they originated from nine production companies in a small geographic area of high pig density in central Iowa. The authors are unaware of APP15 cases diagnosed at other major veterinary diagnostic labs in the United States during that time.

A short survey was used to gather information on all 20 cases from November 2021 to January 2022. Intensive outbreak investigations were conducted on seven of the 20 cases by veterinarians from Iowa State University and members of the Swine Health Information Center's Rapid Response Team in collaboration with the herd veterinarians, site caretakers, and production management. The cases were from seven finishing or wean-to-market sites, each from a different company. The primary objective of the intensive investigations was to explore potential routes of APP15 transmission and evaluate entry events related to swine movements, vehicles and deliveries, and people's movement over 14 days before the outbreak date on each site.

The magnitude of death loss varied. In the most severe case, 50.3% of the pigs in the group died in a single week. Animals were generally medicated with antimicrobials through injection or water. Four of the seven outbreaks investigated reported stress events before the outbreak, e.g., energy and water outages, and three were in the marketing phase. Biosecurity procedures, e.g., downtime between farms, bench entry system, clean-and-dirty side, and shower-in-shower-out, were generally not followed by farm personnel and third-party companies. Due to a lack of knowledge and control over contractors, there are likely many operation connections unknown to producers, e.g., rendering, loading crews, trailer washing, and feed deliveries routes. Of the 20 growing pig sites, 18 used the same rendering company that followed specific routes within a reload station area with common rendering trucks and drivers. All 20 of the cases were within the reload station area. The routes followed by the rendering trucks within the reload station area were unknown to the herd veterinarians, and the rendering company declined to provide more information on the timing of pickups and routes followed. When dead storage and pickup areas were contaminated with APP15, caretakers followed biosecurity procedures that were generally insufficient to prevent the bacteria from being transmitted to the pigs in the barns.

These outbreak investigations demonstrated a heavy reliance on contracted services, such as rendering and load crews, that created a potential for operational connections between production systems. Additionally, there is still a general lack of knowledge and compliance monitoring of biosecurity practices on growing pig sites. These gaps in grow-finish biosecurity make the U.S. swine production vulnerable to emerging, re-emerging, and exotic diseases, such as the African swine fever virus or other foreign animal diseases (FAD).