

Evaluating cardiac puncture blood collection as a reliable and biosecure postmortem diagnostic tool in swine

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Key points:

- Blood collection through cardiac puncture is feasible and practical
- The cardiac puncture method does not contribute to blood spillage and environmental contamination
- Cardiac puncture is an alternative when other sampling procedures are not available

Introduction

Successful diagnostic specimen collection from live pigs requires time and skills. Alternative sampling in breeding herds include the use of processing fluids [1, 2], but in countries where these are not available because of animal welfare [3] or in grow-finisher herds where these practices are not conducted, post-mortem sampling can be an alternative for specimen collection for infectious disease outbreak investigations. Postmortem cardiac puncture (CP) blood collection can be easily obtained as an alternative for pathogen detection, as it is a method known anecdotally amongst veterinarians. Therefore, we decided to explore whether this method can aid in the detection of PRRSV [4, 5].

Materials and Methods

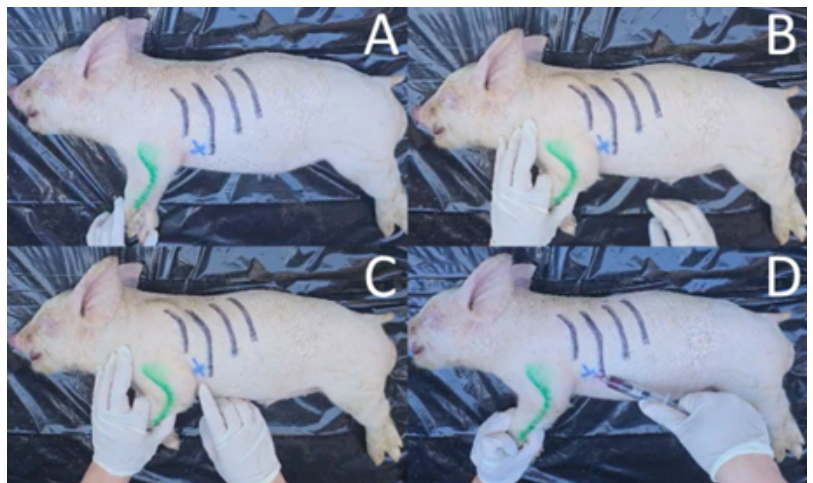
Blood samples were collected at five Midwestern United States farms, three of which were breed-to-wean and two were growing pig farms. All farms were undergoing a PRRSV outbreak. Suckling and growing pigs were included in the study as part of a primary study. At each farm, recently dead or humanely euthanized pigs (i.e., < 24 hours) were placed on right lateral recumbency, the puncture area was identified in the thorax where the olecranon and intercostal space intersected, and a needle was inserted to collect the blood.

Results and Discussion

A total of 286 CP blood samples were collected originating from 196 suckling and 90 growing pigs and tested for PRRSV via RT-PCR. In nine cases, sample collection did not yield enough serum volume for testing, and in four, the RT-PCR reaction was inhibited. Out of the remaining 273 samples, PRRSV was detected in 45% of the samples with a median (Q1, Q3) Ct value of 21.5 (17.1, 28.5), a minimum of 10.8 and maximum of 35.5. Our results highlight the feasibility of obtaining blood samples from recently dead pigs of different ages through CP for viral disease (i.e., PRRSV) diagnosis and surveillance.

Conclusion

Blood collection from dead pigs is a viable welfare-friendly alternative for PRRSV detection. After sample collection, CP is an alternative to obtaining a blood sample for surveillance and diagnosis of pathogens of interest present in the bloodstream (i.e., PRRSV, ASF, CSF) while minimizing blood spillage and environmental contamination which can increase the risk of pathogen dissemination.



Photos of cardiac puncture blood collection sequence from a dead weaned pig. A) placement of pig on right lateral recumbency (forelimb is depicted in green, ribs are marked in black); B) identification of puncture area (intersection between olecranon and intercostal space); C) marked puncture area with an X; and D) insertion of needle in puncture area, retraction of the syringe's plunger, and collection of intracardiac blood.

Full article at: <https://doi.org/10.3389/fvets.2025.1741832>

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