

# PRRS virus detection in dust collected with alternative aerosol collection tools

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Aerosol transmission of Porcine Reproductive and Respiratory Syndrome virus (PRRSv) is a recognized transmission pathway for this virus. Finding the virus in aerosols is still a great challenge because collection efficiency with standard aerosol collection tools is known to be very low. Standard aerosol collection tools are defined in this paper as all those that are based on high-speed air flow aerosol impaction principle on either hard plates, filters, or liquids (see NIOSH Sampling and Characterization of Bioaerosols Manual for details of these methodologies).

All the results discussed in this paper were obtained from aerosol collected close to pig pens (< 2 m) that were housing nursery piglets (n ≈ 15) that have been naturally exposed to PRRSv positive piglets for at least 7 days. Piglets were confirmed to be infected by as PRRSv with serological and oral fluid PCR test.

CDPQ team explored the potential of two alternative custom aerosol collection tools: 1- low-cost aerosols sampler built on a computer cooling fan with low air speed (< 0.25 m/s) and high volume (> 4000 liters) with two different filters (XFAN + cotton gauze; XFAN + MERV11 membrane); 2- passive aerosol sampler based on one hour collection on a simple aluminum foil (ALU method). PRRSv was detected in the collected dust at the Molecular diagnostic laboratory at FMV.

CDPQ team had high success rates with ALU (12/12 positive samples) and XFAN methodologies (17/24 positive samples). XFAN cotton gauze filter gave better results than XFAN MERV11 filter (10/12 versus 7/12). All samples (n = 36) collected at different locations close (< 2m) to PRRSv infected pigs.

**Implications:** This research shows that it is possible to systematically find PRRS virus in aerosols collected within two meters of diseased animals using nonstandard aerosol collectors (XFAN and ALU). These low-cost highly efficient tools will be used to improve our knowledge of the aerosol PRRSv transmission.