

**Title:** Oral fluid testing for cost-effective and efficient surveillance and control of porcine epidemic diarrhea virus in swine population - **NPB #13-226**

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### Scientific Abstract

The objective of the present study was to assess the utility of oral fluid sampling and testing in monitoring viral shedding in comparison to fecal samples under experimental conditions. Sample procurement was conducted in both experimental and field conditions. For experimental samples, 96 4-week-old pigs were randomly allocated into control (n=40) and challenge (n=56) groups. Pigs in the challenge group were randomly distributed in 4 pens, and control pigs were in 2 pens. Pigs were inoculated orally with a PEDV isolate at  $1 \times 10^3$  PFU/ml while control pigs were sham inoculated with cell culture media. Individual fecal swabs and pen-based oral fluids were collected every 24 hours for the first week, and twice a week thereafter for 56 days post inoculation (DPI). Serum samples were also collected periodically. For field samples, practicing veterinarians collected paired oral fluid (n=5-6) and fecal swab samples (n=10-20) from farms (mostly breeding farms) every week after confirmation of PED outbreak and submitted to Iowa State University Veterinary Diagnostic Laboratory for viral testing.

After experimental inoculation, clinical diarrhea was developed in the inoculated pigs 3-5 DPI, which subsided by 10 DPI. According to PCR results on both oral fluids and fecal swabs, viral shedding began on day 1 and reached its peak during 3-4 DPI. Although no clinical signs of virus infection were present after 10 DPI, viral nucleic acid continued to be detected in oral fluids and fecal swabs after 10 through 35 DPI. The level of PEDV-specific antibody in oral fluid was lower than serum as anticipated. Nevertheless, both serum and oral fluid samples showed similar antibody response pattern. On samples collected from the field, fecal shedding of PEDV was not detected by PCR after 3 to 5 weeks since PEDV-associated clinical diarrhea was noted. In contrast, PEDV nucleic acid continued to be detected in oral fluids for 9 to 12 weeks after PEDV-associated clinical diarrhea started. Clinically diarrhea in pigs on the study farms was subsided by 7-14 days after first observation.

Overall oral fluids were shown to be a sample type to accurately detect the presence and circulation of PEDV in pig herds. Swine oral fluid samples could also be used for antibody detection in lieu of traditional serology. All these observations support the utility of swine oral fluid and sampling for surveillance of PEDV in populations.

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