RESEARCH ABSTRACT

SWINE HEALTH

Title: Application of FTA based technology for the collection and transport of clinical samples to detect PRRSV by RT-PCR - **NPB # 09-220**

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Scientific Abstract:

Submission of field samples for porcine reproductive and respiratory syndrome virus (PRRSv) molecular diagnostics can be a challenge if samples cannot be submitted in a timely manner. This study evaluated the safety and the diagnostic sensitivity and specificity of samples embedded in FTA cards for PRRSv RT-PCR testing. FTA cards consist of a cellulose-based matrix paper containing chemicals that lyse the cells in the sample while preserving the nucleic acids. The cards are a safe and easy-to-use method to store and transport samples to conduct molecular diagnostics. Samples for this study originated from both experimentally infected animals and field samples submitted to the Veterinary Diagnostic Laboratory. The analytical sensitivity of PRRSv detection by RT-PCR from serum and oral fluids embedded in FTA cards was reduced 10^2 to 10^4 times compared to detecting the virus directly from serum and oral fluids respectively. However, the virus could still be detected in FTA cards at a very low concentration (10^1 and 10^3 $TCID_{50}$/ml for serum and oral fluids respectively). The specificity and sensitivity of PRRSv RT-PCR detection from FTA-embedded samples collected from experimentally infected animals was 100%. Sensitivity was the same for samples stored in FTA cards at room temperature or at 4°C, and tested overnight or after 14 days. However sensitivity using field serum samples embedded in FTA cards was only 86.1%. The sensitivity for oral fluids in FTA cards from experimentally infected animals was poor, and estimated at 50% from 2 to 16 dpi. After 16 dpi and until the end of the study at 28 dpi, PRRSv could not be detected when the samples were on FTA cards, despite positive PCR results during all sampling days from 2 to 28 dpi when samples were tested directly. Overall sensitivity for oral fluids in FTA cards was 36%. Further validation is needed to improve sensitivity of detecting PRRSv from oral fluids in FTA cards. In addition, cards inoculated with PRRSv positive samples did not yield replicating virus after cell culture. In conclusion, FTA cards proved to be an alternative, safe, simple, sensitive method to transport serum, blood, lymph nodes, tonsils and lung samples from acutely infected animals for PRRSv RT-PCR diagnostics. However, a decrease in RT-PCR sensitivity should be expected especially from oral fluid samples.