

SWINE HEALTH

Title: Evaluation of meat juice as sample matrix for the detection of foot-and-mouth disease virus (FMDV) antigen and nucleic acids as well as antibodies to FMDV; and comparison of 3 real-time reverse transcription polymerase chain reaction assays for FMDV in swine oral fluids. **NPB #18-103**

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Scientific Abstract:

Vesicular fluid, epithelial tags, swabs, serum and other sample types from live animals are routinely used for foot-and-mouth disease virus (FMDV) detection. These samples might not be available in some circumstances and alternative sample types may be required. Meat Juice (MJ) can be collected retroactively from meat for FMDV detection. Meat juice is the exudate recovered after freeze-thaw cycles of skeletal muscle. In this project experiments were performed to demonstrate that MJ can be used for FMDV detection. Skeletal muscle was collected from pigs experimentally infected with FMDV. Meat juice was harvested, ribonucleic acid (RNA) extracted and tested for FMDV genome by real-time reverse transcriptase polymerase chain reactions (RRT-PCR) using the National Centre for Foreign Animal Disease (NCFAD) protocol in parallel with the US National Animal Health Laboratory Network (NAHLN) FMDV RRT-PCR and TetraCore (commercial) FMDV RRT-PCR detection kit. Lateral flow strip test (LFST) was assessed for FMDV antigen detection in MJ. All 3 RRT-PCR assays detected FMDV RNA in MJ from pigs infected with either FMDV serotype A, O, SAT2 or ASIA1. In all cases, FMDV genome detection in sera was short-lived (DPI 1 – 7) compared to MJ which lasted till DPI 21 in some cases. LFSTs detected FMDV antigen in MJ at early DPIs (1 – 9). Furthermore, this study assessed MJ for detection of antibodies to structural proteins (SP) by existing serotype-specific solid phase competitive ELISAs (SPCE). Antibodies to FMDV SP were detected in MJ from experimentally infected pigs in similar trends to antibody detection in sera tested in parallel. The data shows that MJ is a good sample type for FMDV genome and antigen detection, as well as detection of anti-FMDV SP antibodies. Therefore, in the absence of traditional samples, MJ can be used for FMDV testing. In addition, if animals are slaughtered/ euthanized, MJ can be collected alongside other samples for FMDV testing.

These research results were submitted in fulfillment of checkoff-funded research projects. This report is published directly as submitted by the project's principal investigator. This report has not been peer-reviewed.

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