

Title of Proposal: Characterization of the shedding patterns of Seneca Valley Virus (Seneca Virus A) on one sow farm in Minnesota

Project Number: 15-199 SHIC

Principle Investigator: Steve Tousignant, DVM, PhD

Institution: Swine Vet Center, P.A.

Date Report Submitted: 1/25/16

Industry Summary:

Beginning in August of 2015, there were increased reports of vesicular lesions being identified on the snouts and feet of pigs on farms across the United States. Foreign Animal Disease investigations were immediately initiated on these farms. After being confirmed negative for foreign animal diseases, Seneca Valley Virus (or Seneca Virus A (SVA)) was detected in the vesicular fluid collected from those pigs. While not a new disease in the US, the sudden onset of cases this fall is a reason for concern. And while this disease does not appear to cause major production losses, it is significant given the similarity to lesions seen with Foot and Mouth disease.

On September 1st, 2015 a farm in central Minnesota was diagnosed with SVA. First clinical signs were reported as lameness in pens of gilts. Within 2 days, approximately 80% of the sows in gestation and farrowing were showing vesicular lesions on the snout, feet, or both. Sows seemed lethargic, and were reluctant to stand. Fever was not a significant event on this farm and while feed intake was somewhat reduced during the outbreak, it was not as dramatic as expected given the severity of the snout lesions on most sows. In farrowing, pre-weaning mortality (PWM) increased approximately 10% in the groups farrowing during the week of the outbreak. This was attributed to increased rate of laid-on piglets and some neonatal diarrhea, which are thought to be manifestations of the sows having sore feet, not feeling well, and poor milk production.

Within 7 days, lesions on snouts and feet were beginning to heal and sow activity was dramatically improving. By 14 days post-outbreak, most lesions were completely healed and by 21 days post-outbreak, few discernable lesions were found. Additionally, farrowing performance returned to normal by the next farrowing group. Clinical signs were never observed in any piglets in farrowing or post-weaning where they were comingled with piglets from an apparently unaffected sow farm.

A project was initiated to study viral shedding patterns among sows. A total of 34 sows were identified in gestation and samples were collected at 0, 1, 2, 3, 4, 6 and 9 weeks post outbreak. Serum, laryngeal swab, rectal swab and vesicular swabs were collected from each sow at each sampling point. Samples were sent to the University of Minnesota Veterinary Diagnostic Laboratory for testing by polymerase chain reaction (PCR) for SVA.

Duration of shedding was variable among individuals and depended on sample type. In general, sows had a relatively short viremic stage, lasting approximately 7 days. Cycle time (ct) values ranged from 17 – 36 (ave = 33), however, 11 sows (32%) were never viremic at all sampling points and only 7 sows (20%) were viremic by 1 week post outbreak and 0 were positive at 2 weeks post outbreak. At 3 and 6 weeks post outbreak separate sows tested suspect and positive by serum PCR, respectively. All other samples were negative.

In the first week post outbreak, 33 sows (97%) tested positive by Laryngeal samples and CT values ranged from 20 – 27 (ave = 25). There was a steady decrease in the number of sows testing positive over

time, and by 9 weeks post outbreak, only one sow tested suspect. Similarly, 31 (91%) rectal swabs tested positive in the first week, and by 4 weeks post outbreak, only 2 sows were suspect. There were no other positive or suspect rectal swabs at 6 and 9 weeks post outbreak.

Lesions were present on the snouts of all sampled sows at day 0. By 2 weeks, most lesions were healed, and by 3 weeks, there were no remaining lesions found. When the fluid from these lesions was collected, CT values ranged from 12 – 18 (ave = 16), and by 1 and 2 weeks were similar to CT values obtained from laryngeal samples.

Keywords:

Swine, Seneca Virus A, Shedding, Epidemiology, Vesicular

Scientific Abstract:

Seneca Valley Virus (or Seneca Virus A (SVA)) has been detected swine farms in the United States with an alarmingly high rate since the summer of 2015. While not a new virus to the US or the world, little was known about the shedding patterns before now. This study was designed to describe the shedding patterns on one sow farm in the South central part of Minnesota. 2 days after the onset of clinical signs, and foreign animal disease investigation, 34 sows were identified in gestation based on presence of vesicular lesions on the snout and feet. From each sow, a tonsil swab, rectal swab, lesion swab, and serum sample were collected at 0, 1, 2, 3, 4, 6, and 9 weeks post outbreak. From these samples, it is suggested that SVA is shed with considerable individual variation from tonsils for 6 – 9 weeks, the feces/rectum for 4 – 6 weeks, and snout lesions for 2 weeks. Additionally, there was a short viremic period of only 1 week. The results of this study shed light on the shedding patterns of SVA and might also suggest the use of tonsil swabs, or rope samples, for herd surveillance after the initial outbreak.