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Effect of blood collection protocol on pseudorabies virus (Aujeszky's disease) serological test results

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Veterinarians use many different protocols to collect blood from swine. Some practitioners prefer vacutainers, and some prefer using the traditional needle and syringe. Most practitioners rinse the needle and syringe between pigs, but some do not. We examined three blood collection protocols to determine their effect on the results of pseudorabies virus (PRV) serological tests.

Methods

Ten 6.5-month-old crossbred finishing pigs were randomly selected from a commercial finishing barn in which pigs were naturally infected with PRV. Pigs were numbered 1–10. Five mL of blood was collected from each pig in numerical order using a 6-mL syringe and a 16-gauge, 6.25-cm needle using one of three different protocols:

- Protocol 1—New Needle: A new needle and syringe were used for each pig.
- Protocol 2—Rinse: A single needle and syringe were used to bleed all pigs consecutively. The needle and syringe were left intact and rinsed once between the collections from each pig. The needle and syringe were rinsed by drawing 6 mL of distilled water from a total volume of 80 mL into the syringe and then ejecting the water into the manure pit.
- Protocol 3—No Rinse: A single needle and syringe were used to bleed all pigs. The needle and syringe were not rinsed between the collections from each pig.

Table 1

SN titers for pseudorabies virus screen

Pig ID	New Needle and syringe (5 aliquots)					Rinse	No rinse
1	1:64	1:128	1:128	1:64	1:64	1:64	1:64
2	1:8	1:8	1:8	1:16	1:16	1:16	1:16
3	1:8	1:8	1:8	1:16	1:16	1:2	1:16
4	1:8	1:16	1:8	1:8	1:8	1:2	1:8
5	1:8	1:8	1:8	1:8	1:8	1:8	1:16
6	1:16	1:8	1:16	1:16	1:8	1:8	1:16
7	1:32	1:16	1:16	1:16	1:32	1:32	1:32
8	1:32	1:32	1:32	1:32	1:32	1:64	1:32
9	1:64	1:64	1:128	1:64	1:64	1:64	1:64
10	1:16	1:16	1:16	1:16	1:16	1:16	1:16

Table 2

G1 PCFIA test results for pseudorabies virus

Pig ID	New Needle and syringe (5 aliquots)					Rinse	No rinse
1	+	+	+	+	+	+	+
2	+	invalid	+	invalid	+	+	+
3	+	+	+	+	+	+	+
4	+	+	+	+	+	+	+
5	+	+	+	+	invalid	+	+
6	+	+	+	+	+	+	+
7	+	+	+	+	+	+	+
8	+	+	+	+	+	+	+
9	+	+	+	+	+	+	+
10	+	+	+	+	+	+	+

Sera were submitted to an American Association of Veterinary Laboratory Diagnosticians-certified state diagnostic laboratory for PRV serum neutralization (SN) screening titers and G1 Particle Concentration Fluorescence Immunoassay (G1 PCFIA) tests. Samples from individual pigs in the New Needle protocol were divided into five aliquots prior to submission to evaluate the variability of the diagnostic tests.

CWR, SFA, KLC, JAJ: Swine Production Medicine, Purdue University, 1248 Lynn, West Lafayette, Indiana, 47907–1248.

Diagnostic notes are not peer-reviewed.

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Results

All samples from the Rinse and No Rinse protocols were positive for PRV by SN assay (Table 1). SN titers were equal for all five aliquots for three of 10 of pigs when the New Needle protocol was used. Titers for the remaining seven pigs varied by a maximum of 1 dilution. Slight variations of this magnitude are normal.

The SN titers when using New Needle or No Rinse protocols matched within one titer for all pigs. The SN titers for blood collected using the New Needle or Rinse protocols matched within one titer for eight of 10 pigs. The SN titer was two- to fourfold times lower in two of the Rinse protocol samples than in the other protocols.

Three of 50 aliquots (two of 10 pigs) from the New Needle protocol were reported as "invalid" because they were unreadable by the computer and the rest were positive by G1 PCFIA (Table 2.)

Discussion

Although all pigs in this study were reported as positive for PRV, we conclude from the results of this study that rinsing the needle and syringe between samplings could lower the SN titer. The drop in titers measured in this study was likely the result of dilution by water left in the syringe or needle.

If you rinse with chemicals, such as disinfectants, you could also interfere with the test results. Using a new needle and syringe for each pig during blood testing is impractical with large populations and not the norm in the field today.

Failing to rinse the needle and syringe between pigs provided results consistent with that of using new needles and syringes, but this method is not recommended. This procedure may enhance the possibility of mechanically transmitting virus from a viremic pig to a negative pig. However, the probability of natural transmission of infection to a penmate via direct contact or even a rinsed needle and syringe may balance this risk. Rinsing may also prevent the needle and syringe from becoming grossly contaminated with skin debris and surface bacteria, thus minimizing bacterial complications.

In conclusion, we would recommend rinsing needles and syringes with water in between pigs as is practiced by most veterinarians.