New blood collection technique for porcine reproductive and respiratory syndrome virus monitoring in boars

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Porcine reproductive and respiratory syndrome virus (PRRSV) can be transmitted through infected semen. Consequently, early detection of PRRSV infection in boar studs is critical to prevent downstream contamination of sow herds.1,2 Boar-stud monitoring has been based on polymerase chain reaction (PCR) testing of semen for many years. However, it has been recently demonstrated that PCR testing of serum or blood samples is more sensitive in detecting early PRRSV infections than is testing of semen samples.3-7

Effective PRRSV monitoring of boar studs by PCR testing serum or blood requires repetitive blood sampling of animals.3,8 Jugular bleeding is the method of choice when large numbers of animals must be sampled.9 Sampling from the coccygeal vessels is safe and relatively easy to perform without restraint during semen collection. This method may be difficult in boars with docked tails, but may be mastered (A. Broes, personal observations, 2006). Lateral saphenous veins may be used in animals with a thin hairless skin and prominent veins. However these veins are not always accessible during semen collection (A. Broes, personal observations, 2006).

Recently, Reicks has proposed using swabs to collect blood from the ear vein for PCR testing.10 This method can easily be performed in unrestrained boars during semen collection. Blood swabs have been successfully used for PCR testing,5 but PCR using blood swabs is less sensitive than PCR using serum. Approximately 10 times fewer PRRSV genome copies are contained in a blood swab diluted in 0.75 mL of saline than are in 180 μL of serum (M. Bélanger, unpublished data). According to Reicks, using 0.5 mL of diluent would cause approximately a seven- to 11-fold dilution effect,8,10 which might restrict the possibility of pooling samples to reduce the cost of testing.10,11

Also of importance is the fact that the PRRSV genome may not be detected if significant genetic differences exist between the PRRSV isolate and the primers used in the PCR assay.12 In such cases, serological testing represents an interesting complement to detect infection. Samples other than serum have been successfully used for PRRSV serological testing. As an example, filter paper blotted with blood has been used to detect PRRSV antibodies by ELISA.13,14 However, the feasibility of using blood swabs for serological testing has not been evaluated so far.

A blood collection method applicable to unrestrained boars and able to obtain a significant volume of serum would be valuable. Recently, Yoon et al15 have suggested use of the Safe-T-Fill capillary blood collection system (RAM Scientific, Yonkers, New York). However, a maximum volume of only 300 μL of blood is collected by this system, and animals must be immobile in order to prevent air-bubble formation in the capillary tube. Dewey and Carman16 have proposed use of microtubes (Microvettes; Sarstedt Inc, Montreal, Quebec, Canada) by letting the blood flow into the capillary tube. The maximum blood volume per tube is 500 μL, and several tubes may be collected per animal.

during semen collection to provide enough serum for both PRRSV serological and PCR testing.

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References

Figure 1: A rubber band has been placed at the base of the boar’s ear and the skin has been scrubbed with alcohol in preparation for collection of blood from the ear vein.

Figure 2: An 18-gauge, 1” needle has been fixed onto the capillary tube and then inserted into the ear vein of a boar mounted on a dummy for semen collection. The capillary tube may be filled within a few seconds.


* Non-refereed references.
Figure 3: After collecting blood from the ear vein of a boar using the Bio-Tube system (Biovet Inc, St-Hyacinthe, Quebec, Canada), the capillary tube is removed and the tube is closed with a screw cap.