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Main topic : Surveillance and control of emerging diseases

Detection and differentiation of PCV2 and PCV3 using a multiplex real-time PCR test

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Introduction

Porcine circovirus type 2 (PCV2) is associated with a broad range of clinical diseases, including systemic disease. Porcine circovirus type 3 (PCV3) infections are thought to be linked to porcine circovirus diseases-like scenarios. This study reports on the detection and differentiation of PCV2 and PCV3 DNA using a new real-time PCR and compares it with existing detection methods.

Methods

A total of 161 and 190 field samples were used for PCV2 and PCV3 comparison testing, respectively. Test 1 (RealPCR PCV2/PCV3 Multiplex DNA Test, IDEXX) was compared with existing PCR tests at veterinary diagnostic laboratories. The limit of detection of Test 1 was also determined.

Results

Investigation of the limit of detection showed that Test 1 consistently detected PCV2 and PCV3 targets at concentrations between 10 copies and one copy per reaction.

Comparison of Test 1 with existing PCR tests showed that the percent agreement for testing diagnostic samples was 97.5 and 97.9% for PCV2 and PCV3, respectively. Discrepant PCR results between tests showed late Ct values in one or the other test.

Conclusions

Detection and differentiation of PCV2 and PCV3 DNA in a multiplex reaction is a cost-effective approach for testing relevant porcine circovirus infections with laboratory workflow advantages.

As analytical sensitivity testing demonstrated, Test 1 consistently detected ≥ 10 copies per reaction of PCV2 and PCV3 DNA. Similarly, a high agreement with other PCR tests used at several locations for testing field samples was shown.

This study shows high analytical sensitivity of a new real-time PCR for detection and differentiation of PCV2 and PCV3 DNA. In addition, comparable results to existing PCR tests in use in veterinary diagnostic laboratories were found, with the added benefit of detection and differentiation of PCV2 and PCV3 DNA in a single reaction.