Title: Comparison of the virulence of PCV2 isolates from field cases with and without hallmark lesions of lymphoid depletion - NPB #04-125

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Abstract

There are marked differences in clinical expression of diseases associated with porcine circovirus type 2 (PCV2) in the field. The objective of this study was to compare the sequences and virulence of PCV2 isolates from field cases with and without PCV2-associated lesions. Forty-two specific-pathogen-free (SPF) pigs were randomly assigned to three groups of 14 pigs each. At seven weeks of age, group 1 pigs were sham-inoculated with saline, group 2 pigs were each inoculated with PCV2-4838 (isolated from a pig with no evidence of PCV2-associated lymphoid lesions), and group 3 pigs were each inoculated with PCV2-40895 (isolated from a pig with PCV2-associated lymphoid lesions and disease). The PCV2-4838 and PCV2-40895 isolates shared approximately 98.9% of their nucleotide sequence identity across the entire genome. A total of 9 amino acid changes in ORF2 and 2 amino acid changes in ORF1 were identified between the two isolates. The PCV2-4838 inoculated pigs had significantly ($P < 0.0001$) more genomic copy numbers of PCV2 in sera at seven days post inoculation (DPI) and significantly ($P < 0.05$) fewer genomic copy numbers at 14, 21, and 28 DPI compared to pigs inoculated with PCV2-40895 isolate. Microscopic lesions in lymphoid tissues were significantly ($P < 0.05$) less severe and the amount of PCV2-antigen associated with these lesions was significantly lower ($P < 0.05$) in pigs inoculated with PCV2-4838. The results of this study confirm that PCV2-isolates differ in virulence in a SPF pig model typical of modern production systems in North America. This new information helps explain differences in severity of clinical manifestation of PCV2-associated diseases from farm-to-farm.