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The impact of PCV2 viremia in a high health Canadian swine herd, a vaccination trial comparing two commercial vaccines.

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Introduction- Subclinical infections with PCV2 are common (Darwich et al., 2007; Krakowka et al., 2005) and can occur in the absence of co-factors or if vaccination does not prevent viral replication (Fort et al., 2008). PCV2 viremia produces immune system activation (Kekarainen et al., 2008) which causes the redirection of nutrients intended for growth to counteract disease challenge (Colditz, 2002).

Objective- The objective of this field trial was to determine the association between vaccine status and productivity in a nursery and grower-finisher (G-F) system. Productivity was measured as average daily gain (ADG), mortality and carcass quality (carcass weight, percent yield, kilograms of lean meat and millimetres of fat).

Materials and Methods- 2,146 pigs were selected from a PRRS and *M. hyopneumoniae* free herd. The pigs were individually randomly allocated to one of three treatment groups: 1. One dose vaccinated pigs (1-D) (Circoflex™, BIVI) (n=1026); 2. Two dose vaccinated pigs (2-D) (Circumvent® ISPAH) (n=1020); and 3. Controls injected with saline (Cx) (n=100). Pigs were individually weighed at approximately 3, 11 and 20 weeks of age as well as prior to slaughter (at least 107 kg). Blood samples were taken from a fixed group of 122 randomly selected pigs at 3, 9, 15, 19, 23 and 26 weeks of age. Viremia was measured using qPCR.

Results- Starting weights did not differ by group. In the nursery, the 2-D pigs had a lower ADG (462 g ± 63.6) than the 1-D pigs (477 g ± 63.7) ($P<0.001$), while during the G-F period, (11 to 26 wks of age) the 2-D pigs had a higher ADG (892 g ± 92.1) than 1-D pigs (887 g ± 97.0) ($P<0.05$). The first indications of viremia and PCV2 disease were detected at the end of the nursery period. 1-D pigs had a lower ADG (866 g ± 22) compared to 2-D pigs (892 g ±15) ($P<0.005$) from 19 weeks of age to slaughter. Also during this time, viremic pigs had a lower ADG (853 g ± 16) than non-viremic pigs (887 g ± 22) ($P<0.01$). Viremia was identified in 85% (Cx), 43% (1-D) and 10% (2-D) of sampled pigs throughout the G-F phase ($P<0.05$). During this time, viremia was detected at least twice (persistant viremia) in 43% (Cx), 12% (1-D) and 0% (2-D) of sampled pigs. These pigs had a lower ADG (839 g ± 13) compared to those that were detected viremic only once (889 g ± 21) ($P<0.01$). During the G-F phase, mortality was significantly higher in the control group (5.1%) than the 1-D (1.72%) and 2-D (1.63%) vaccine groups ($P<0.05$). The 1-D pigs had fewer kilograms lean meat/carcass (60.38 kg ± 5.85) than the 2-D pigs (60.54 kg ± 5.9) ($P<0.05$).

Discussion- In this trial the losses resulting from subclinical disease were significant. The G-F mortality was lower in vaccinated pigs than unvaccinated pigs. Viremic pigs had a lower ADG than non-viremic pigs and pigs vaccinated twice were less likely to be viremic than those vaccinated once or not at all. Overall, vaccination reduced mortality and increased ADG. However, only the 2-D vaccine was able to control viremia during the highest PCV2 challenge and as a result the ADG was maximized by the 2 dose regime.

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