# Utilization of laboratory testing for monitoring PCV2 vaccination programs

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## Introduction

Vaccination for porcine circovirus type 2 along with My*coplasma hyopneumoniae* (Mhp) is performed in nearly all swine operations. That said, vaccination compliance along with logistic considerations related to other procedures, pig health at the time of vaccination and the potential for vaccine interference by maternally-derived antibody (MDA) need to be considered when developing and implementing vaccination programs. Serological monitoring is commonly done to assess the potential for MDA interference, to evaluate post-vaccination immune responses which can serve as an indicator for vaccination compliance and to determine the onset of infection.[1] The objective of the study reported here was to evaluate different serological assays for Circumvent® PCV M compliance monitoring.

## Materials and Methods

Pigs were vaccinated with Circumvent® PCV M at processing (3-4 days of age) and weaning (3 weeks of age) as directed by the herd veterinarian. Immediately after weaning, selected pigs were ear tagged and blood sampled at the nursery site. The initial plan was to bleed the pigs again at 6 weeks of age (WOA). Due to the poor antibody responses at 6 WOA, additional samples were collected at 10, 15 and 21 WOA. A second group (B) was started 8 weeks after the first group (A) using the same altered protocol. All laboratory testing was performed at the Iowa State University Veterinary Diagnostic Laboratory. PCV2 serum antibodies were measured by 4-Dilution PCV2 IFA, Ingezim Circovirus IgG (INGEL) (Ingenasa, Madrid, Spain) and PCV2 ELISA (PCVEL). Mhp serum antibodies were measured by ELISA (MHEL) (IDEXX, Westbrook, ME). Titer values are reported as the group geometric mean. For the IFA test, a titer ≥640 was considered positive. S/P ratios and PCR cycle times (CT) are reported as group means. Selected time points were tested for PCV2 by PCR.

## Results

Table 1 presents the Group A data. Overall, post-vaccination responses at 6 and 10 WOA were lower than expected. MDA interference may have been responsible for lower Mhp titers but were not a consideration for the low PCV2 IFA titers. The INGEL and PCVEL were not done at 3 and 6 WOA due to misplacement of the samples. Subsequent testing indicated exposure to PCV2 and Mhp by all assays. PCV2 PCR and IFA indicated onset of PCV2 infection between 15 and 21 WOA.

Table 2 presents the results from Group B. PCV2 PCRs were negative up through 20 WOA. The post-vaccination antibody response is consistent with proper vaccination. PCV2 MDAs were low and Mhp MDAs were lower than observed with Group A.

**Table 1.** Group A Results

| Age (wks) | No. positive/No. tested | | | | |
|---|---|---|---|---|---|
| | IFA | INGEL | PCVEL | MHEL | PCR |
| 3 | 8/20 | ND | ND | 17/20 | ND |
| 6 | 4/20 | ND | ND | 6/20 | ND |
| 10 | 4/19 | 15/19 | 17/19 | 3/19 | ND |
| 15 | 2/19 | 8/19 | 8/19 | 0/19 | 0/19 |
| 21 | 17/19 | 19/19 | 19/19 | 13/19 | 16/19 |
| | Titers | | S/P Ratios | | CT |
| 3 | 134.5 | ND | ND | 0.985 | ND |
| 6 | 109.3 | ND | ND | 0.462 | ND |
| 10 | 119.5 | 333.2 | 0.662 | 0.242 | ND |
| 15 | 92.6 | 122.5 | 0.416 | 0.100 | >37 |
| 21 | 856.9 | 1097.6 | 1.073 | 0.738 | 30.1 |

Table 2: Group B Results

| Age (wks) | No. positive/No. tested | | | | |
|---|---|---|---|---|---|
| | IFA | INGEL | PCVEL | MHEL | PCR |
| 3 | 0/25 | 25/25 | 25/25 | 7/25 | 0/25 |
| 6 | 22/23 | 23/23 | 23/23 | 23/23 | 0/23 |
| 10 | 19/24 | 24/24 | 24/24 | 23/24 | 0/24 |
| 16 | 17/22 | ND | 9/22 | 22/22 | 0/22 |
| 20 | 0/22 | ND | 13/22 | 24/24 | 0/24 |
| | Titers | | S/P Ratios | | CT |
| 3 | 80 | 653 | 0.748 | 0.303 | >37 |
| 6 | 1037 | 8299 | 0.987 | 1.737 | >37 |
| 10 | 640 | 1427 | 0.816 | 1.692 | >37 |
| 16 | 273 | ND | .299 | 1.542 | >37 |
| 20 | 128 | ND | .413 | 1.300 | >37 |

## Conclusions and Discussion

It appears that Group A was not properly vaccinated as all assays showed poor responses to PCV2 and Mhp. Group B appears to be properly vaccinated with nearly all pigs showing positive responses in all tests With regard to the different assays, the IFA, INGEL and MHEL appear to be more discriminating than the PCVEL based on the titers or S/P ratios at 3 vs. 6 WOA in Group B.

## References

1. Pittman J, et al. 2009. Proc AASV Annual Meeting, Dallas, Texas, pp. 207-11/