

## ANIMAL SCIENCE

**Title:** Development of a Nutrition × Health Interaction Model to Study Nursery Pig Performance - NPB #12-185

**Investigator:** Phillip Miller

**Institution:** University of Nebraska - Lincoln

**Co-Investigators:** Thomas Burkey, Daniel Ciobanu, Samodha Fernando

**Date Submitted:** August 28, 2014

revised

### Scientific Abstract

To investigate the effects of complex and prebiotic diets on nursery pigs inoculated with or vaccinated against PCV2 on growth performance and immune parameters, 96 weaned barrows (age 27 to 40 d; BW 7.1 kg) were housed (4 pigs/pen) in an environmentally-controlled nursery with ad libitum access to feed and water over a 28-d study. Forty-eight pigs were vaccinated (VAC) for PCV2 prior to arrival, while remaining 48 pigs (PCV) were inoculated with PCV2 on d 0. Pigs were randomly assigned to 1 of 3 diets: complex (CO; lactose, spray-dried plasma, spray-dried whey), simple (SI; corn and SBM), or simple + 2.5% Grobiotic-S (GS). Blood samples were obtained twice per week (d -2 to 28) for serum cytokine and PCV2-specific immunoglobulin (Ig) G and M quantification. No significant time, diet, or PCV-status interactions were observed for growth performance. Body weight tended ( $P < 0.06$ ; d 14 to 28) to be greater in VAC (11.1 to 18.4 kg) compared to PCV (10.3 to 16.7 kg) pigs, and overall ADG ( $P < 0.04$ ) and ADFI ( $P < 0.03$ ) were greater in VAC (0.40 kg and 0.68 kg, respectively) compared to PCV (0.35 kg and 0.61kg, respectively) pigs. Overall, pigs fed CO (0.71 kg) had greater ( $P < 0.02$ ) ADFI compared to GS (0.61 kg) pigs and tended ( $P < 0.08$ ) to be greater than SI (0.63 kg) pigs. Pigs fed CO (0.60) had greater ( $P < 0.05$ ) G:F (d 0 to 7) compared to GS (0.46) and SI (0.51); however, G:F ( $P < 0.05$ ; d 21 to 28) was decreased in CO (0.59) pigs compared to SI (0.67) pigs. For IgG, a diet × PCV-status interaction was observed ( $P < 0.04$ ); PCV pigs fed SI and GS had increased PCV2-specific IgG ( $P < 0.05$ ) compared to CO pigs. No effects of PCV-status or diet were observed with respect to IL-12p40, IL-6, IL-8, IL-10, or TNF- $\alpha$ ; however, main effects of PCV-status (IFN- $\alpha$ ;  $P < 0.01$ ) and diet (IL-1 $\beta$ ;  $P < 0.03$ ) were observed. Specifically, greater IFN- $\alpha$  was observed for PCV compared to VAC pigs on d 11 ( $P < 0.02$ ) and 14 ( $P < 0.02$ ), and pigs fed CO had greater overall IL-1 $\beta$  compared to GS ( $P < 0.04$ ) and SI ( $P < 0.02$ ). Results indicate a complex nursery diet may improve post-weaning growth performance and affect immune response to PCV2 infection.

---

These research results were submitted in fulfillment of checkoff-funded research projects. This report is published directly as submitted by the project's principal investigator. This report has not been peer-reviewed.

---

For more information contact:

National Pork Board • PO Box 9114 • Des Moines, IA 50306 USA • 800-456-7675 • Fax: 515-223-2646 • [pork.org](http://pork.org)

---