RESEARCH ABSTRACT

PORK SAFETY

Title: Conjugated Linoleic Acid and Vitamin A: A Nutritional Therapy for Post-weaning Multisystemic Wasting Syndrome **NPB# 01142**

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Abstract

Dietary CLA-supplementation enhanced antigen-specific proliferation of porcine $CD8^+$ T cells to viral antigens following vaccination of pigs with a modified-live pseudorabies virus vaccine. Challenge studies using infective viruses, however, are necessary to investigate if nutritionally derived immune enhancement results in increased protection from viral disease. The present study used a viral infection model [i.e., type 2 porcine circovirus (PCV2)] to examine the effects of dietary CLA-supplementation on virally induced lymphoid depletion and immune suppression. We hypothesized that PCV2-associated disease can be ameliorated by feeding CLA prior to the viral challenge. To test this hypothesis, following 42 days of dietary supplementation with either soybean oil or CLA, viral disease was induced by challenging pigs with PCV2. A factorial (2×3) arrangement within a split-plot design with 16 blocks of three littermate pigs as the experimental unit for infective status (i.e., infected with PCV2 or non-infected) and pig within block as the experimental unit for dietary treatment (i.e., control, CLA, or CLA & 10 fold Vitamin A). Lymphoid depletion of the lymph nodes and interstitial pneumonia in the lungs was macroscopically and histopathologically evaluated. The phenotype of the depleted lymphocyte subsets was characterized by flow cytometry. Proliferation of lymphocytes in response to *ex vivo* stimulation with a recombinant capsid protein open reading frame 2 (ORF2) of PCV2 was assessed by PKH67 and blastogenesis assays. Serum samples were assayed for the presence of ORF2-specific antibodies using an indirect enzyme-linked immunosorbent assay and IFA. Dietary CLA-supplementation enhanced the *ex vivo* proliferative responses of peripheral blood and lymph node mononuclear cells to ORF2 antigens. Lymphocytes with enhanced antigen-specific proliferative abilities in CLA-fed pigs were primarily $CD8^+$ T cells. In contrast to the enhancement of T cell responses, B cell effector functions were either maintained or decreased as shown by the lower concentrations of PCV2-specific antibodies in infected pigs fed CLA. These immunological changes resulted in a lower lymphocyte depletion (i.e., B cells) in peripheral blood, and lower growth suppression in CLA-fed pigs following infection.