**PHAGOCYTIC RESPONSE TO ZINC AMINO ACID COMPLEX SUPPLEMENTATION**

Marco A. Rebollo, Cheng Zhang, Thim K. Cheng, Leonardo Linares, Terry L. Ward

Phagocytes play a pivotal role in innate and adaptive immune responses. Zinc supplementation can improve macrophage functions: uptake and killing of pathogens, signaling and release of pro-inflammatory cytokines (TNFα, IL-1B, IL-8). Zinc is a basic component of calprotectin (L 1 protein), and is essential for dendritic cell function and efferocytosis. A study was performed to evaluate phagocytic capacity of peritoneal macrophages from male Nicholas turkeys. Forty birds were fed 40 ppm Zn and 40 ppm Mn from metal amino acid complexes (Zn/Mn-AA, Zinpro Corp.), compared to 40 control birds fed 80 ppm Zn and 120 ppm Mn from sulfate sources. At d 28, Zn/Mn-AA treatments showed an improved response in number of opsonized sheep red blood cells of 6.5 per macrophage compared to 4.5 in groups fed Zn and Mn sulfates (*P* < 0.05). Macrophage tumoricidal activity was 65% for Zn/Mn-AA treatments vs. 25% for sulfates, with a significant difference (*P* < 0.05) at 35 d. Total Immunoglobulin (IgY) titers showed a significant difference (*P* < 0.05), 0.05 Log3 in Zn/Mn-AA treatments vs. 0.6 Log3 for sulfates. Another study testing the rate of *E. coli* disappearance in 21-day-old female turkeys injected intravenously with pathogenic *E. coli* (0.2ml 1 x 106 CFU) showed significantly reduced CFU recovered from blood at 60, 20, and 180-min post-inoculation, comparing turkeys fed 40 ppm Zn from Zn-AA with turkeys fed 100 ppm Zn from sulfates. Both peritoneal and endothelial macrophages increased phagocytic activity in turkeys fed Zn/Mn-AA and Zn-AA sources.