Report as of FY2006 for 2006DE75B: "The Effects of Dietary Level and Source of Copper on Broiler Copper Excretion and Movement of Copper Through Broiler Excreta-Amended Soils"

Publications

- Water Resources Research Institute Reports:
  - Tobias, J., and W. Saylor, 2007, The Effects of Dietary Level and Source of Copper on Chemically-defined Fractions of Copper in Broiler Excreta, Delaware Water Resources Center, University of Delaware, Newark, Delaware, 6 pages.
- Other Publications:
  - Boyd, A., ed., 2006, Delaware Water Resources Center WATER NEWS Vol. 6 Issue 2 Nine DWRC Internship Winners for 2006 2007, http://ag.udel.edu/dwrc/newsletters/Summer2006.pdf, p. 6-7.

Report Follows

Undergraduate Internship Project #6 of 9 for FY06

Jarvon Tobias researched *"The Effects of Dietary Level and Source of Copper on Broiler Copper Excretion and Movement of Copper through Broiler Excreta-Amended Soils"* for her ***DWRC / Institute of Soil and Environmental Quality (ISEQ)*** co-sponsored project. The advisor for this internship, which is a continuation of work done by another ***DWRC*** intern last year, was Dr. William Saylor of ***University of Delaware's (UD)*** Department of Animal and Food Sciences. From her research on the effects of copper in poultry feed on the fate of copper in manures applied to cropland, Jarvon improved our understanding of how diets can be formulated to optimize poultry health while protecting water quality.

Abstract

An experiment was conducted to determine the effect of dietary Cu level and source on broiler Cu excretion in 192 day-old straight run male broiler chickens from 1-21d. Diet treatments were 1) Control- basal diet without any additional supplemental Cu; 2) Inorganic Cu at 25 mg/kg Diet- composed of basal diet plus 25 mg/kg Cu from Cu_2SO_4; 3) Organic Cu at 25 mg/kg Diet— composed of basal diet plus 25 mg/kg Cu from Cu-proteinate[1]; 4) Inorganic Cu at 100 mg/kg Diet— composed of basal diet plus 100 mg/kg Cu from Cu_2SO_4; 5) Organic Cu at 100 mg/kg Diet—composed of basal diet plus 100 mg/kg Cu from Cu-proteinate[a]; 6) Inorganic Cu at 250 mg/kg Diet- composed of basal diet plus 250 mg/kg Cu from Cu_2SO_4; 7) Organic Cu at 250 mg/kg Diet—composed of basal diet plus 250 mg/kg Cu from Cu-proteinate[a]. Diets one, two and three were randomly assigned to 8 replicate pens and four through seven to 6 replicate pens. The broiler chicks were randomly assigned to one of the 48 pens in Petersmine Battery Brooders (4 birds per pen.) On day 7, the pens were equalized to 4 birds per pen and reared on a 23-hour light: 1-hour dark lighting cycle. The excreta collected from a random sample of diets 2, 4, 6, and 7, were subjected to a fractionation procedure in order to determine the passage of different types and concentrations of Cu to the excreta. It was determined that as the Cu concentration in the excreta increased, the amount recovered in the excreta increased as well. Organic form of Cu was found to be more prevalent in the samples of the same Cu concentration. Most Cu lost in the fractionation procedure was at the Oxide and Sulfur Bound fractionation.

1 Bioplex™ Minerals; Alltech, Inc., Nicholasville, KY 40356