



Tropentag, September 18-20, 2019, Kassel

“Filling gaps and removing traps
for sustainable resource management”

Chelated Copper, Zinc and Manganese Improved Performance, Haematological and Serum Biochemical Indices of Layers (late-lay)

OLUWATOMIDE ARIYO¹, OLUSEYI O. OLUWATOSIN¹, OLUSESAN FAFIOLU¹, ABIODUN AYOOLA²,
OLUREMI OSINOWO², LUIS AZEVEDO³

¹Federal University of Agriculture Abeokuta, Dept. of Animal Nutrition, Nigeria

²Federal University of Agriculture Abeokuta, Centre of Excellence in Agricultural Development and Sustainable Environment, Nigeria

³Novus International Inc., Research and Development, United States of America

Abstract

The growth performance, haematological and serum biochemical indices of laying hens (late lay) fed diets supplemented with inorganic or chelated blends of copper, zinc and manganese were evaluated. A 77-day feeding trial was carried out using 540 (58 weeks old) Nera Black Hens. Birds were randomly allocated to five dietary treatment groups with 12 replicates of 9 birds each. The diets consisted of control (0, 0 and 0 mg kg⁻¹ of Cu, Zn and Mn respectively), inorganic trace minerals (ITM) supplementation at 16, 64 and 64 mg kg⁻¹ of Cu, Zn and Mn, chelated trace mineral (CTM) supplementation at 16, 64 and 64 mg kg⁻¹ of Cu, Zn and Mn (100% CTM), CTM supplementation at 8, 32 and 32 mg kg⁻¹ of Cu, Zn and Mn (50% CTM) and CTM supplementation at 4, 16 and 16 mg kg⁻¹ of Cu, Zn and Mn (25% CTM) in that order. On day 77 of the experiment, 2.5 mL of blood was collected individually from 4 birds per replicate via brachial vein puncture and transferred to sample tubes containing EDTA for hematological analyses. Another 2.5 mL of blood was collected into sample tubes for serum biochemical analyses. Data collected were subjected to One-Way Analysis of Variance with 5% significance in a Completely Randomised Design. Feed intake was increased ($p < 0.05$) with ITM supplementation while 50% CTM and 100% CTM reduced feed intake (117.29 and 116.18 g b⁻¹ d⁻¹ respectively). Kg feed per kg egg was better for diets supplemented with CTM. CTM supplementation at 50 and 100% increased ($p < 0.05$) packed cell volume (PCV) while white blood cell count was similar ($p > 0.05$) across all treatment groups. Supplementation of CTM led to a higher ($p < 0.05$) total serum protein and albumin. Globulin, creatinine and ALT were not affected ($p > 0.05$) while 100% CTM increased AST IU L⁻¹. ITM supplementation resulted in increased ($p < 0.05$) cholesterol (192.35 mg dL⁻¹) and LDL (140.47 mg dL⁻¹) levels in the sera while CTM supplementation increased ($p > 0.05$) HDL. This study revealed that CTM supplementation improved kg feed/kg egg, PCV, total serum protein and albumin of layers in late lay.

Keywords: Chelated trace minerals, haematology, inorganic salts, performance, serum biochemistry