

The Effects of Organic or Inorganic Zinc and Microbial Phytase, Alone or in Combination, on the Performance, Biochemical Parameters and Nutrient Utilization of Broilers Fed a Diet Low in Available Phosphorus

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Abstract : This study examined the effects of zinc (Zn) from different sources and microbial phytase on the broiler performance, biochemical parameters and digestibility of nutrients when they were added to broiler diets containing low available phosphorus. A total of 875, 1-day-old male broilers of the Ross 308 strain were randomly separated into two control groups (positive and negative) and five treatment groups each containing 125 birds; each group was divided into 5 replicates of 25 birds. The positive control (PC) group was fed a diet containing adequate concentration (0.45%) of available phosphorus due to mineral premix (except zinc) and feeds. The negative control (NC) group was fed a basal diet including low concentration (0.30%) of available phosphorus due to mineral premix (except zinc) and feeds. The basal diet was supplemented with 0.30% phosphorus and 500 FTU phytase (PH); 0.30% phosphorus and organic zinc (OZ; 75mg/kg of Zn from Zn-protein); 0.30% phosphorus and inorganic zinc (IZ; 75 mg/kg of Zn from ZnSO₄); 0.30% phosphorus, organic zinc and 500 FTU phytase (OZ + PH); and 0.30% phosphorus, inorganic zinc and 500 FTU phytase (IZ + PH) in the treatment groups 1, 2, 3, 4 and 5, respectively. The lowest value for mean body weight was in the negative control group on a diet containing low available phosphorus. The use of supplementation with organic and inorganic zinc alone or in combination with microbial phytase significantly ($P < 0.05$) increased the digestibility of Zn in the male broilers. Supplementation of those diets with OZ + PH or IZ + PH was very effective for increasing the body weight, body weight gain and the feed conversion ratio. In conclusion, the effects on broilers of diets with low phosphorus levels may be overcome by the addition of inorganic or organic zinc compounds in combination with microbial phytase.

Keywords : broiler, performance, phytase, phosphorus, zinc

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