# INVESTIGATION ON THE EFFECT OF TRACE MINERAL SOURCE ON PARAMETERS OF BIOAVAILABILITY IN BROILER CHICKENS

*Annika Mählmeyer[1], Jennifer Lindel[1], Alexandra Schlagheck[1], Bastian Hildebrand[1], Klaus Männer[2]*

*[1]Biochem Zusatzstoffe Handels- und Produktionsges. mbH, Küstermeyerstraße 16, D-49393 Lohne*
*[2]Freie Universität Berlin, Faculty of Veterinary Medicine, Institute of Animal Nutrition, Königin-Luise-Straße 49, D-14195 Berlin*

*Corresponding author: Annika Mählmeyer*
*e-mail: maehlmeyer@biochem.net; tel.: +494442 9289-0*
*Address: Küstermeyerstraße 16, D-49393 Lohne*

**Abstract.** A study was conducted to investigate the effect of two sources of Cu, Fe, Mn, and Zn on zootechnical performance, as well as apparent total tract digestibility (ATTD) and accumulation of these trace minerals in liver, tibia bone (TB), breast muscle, and skin of broiler chickens by a depletion-repletion study design. Seventy-two 1-day-old male broiler chickens (Cobb 500) were divided in three feeding groups. A 14-days depletion period with feeding only native contents of trace minerals was followed by a 14-day repletion with two groups supplemented either with glycine-bound (Gly) or sulfate-bound (Sul) trace minerals. The third group received the repletion diet without trace mineral supplementation (Basal). The trace mineral supplementation improved the body weight gain ($P<0.05$) and food conversion ratio ($P<0.05$) compared to basal diet. ATTD of trace minerals was higher in the Gly-group for all elements and higher in the Sul-group for Mn compared to basal group ($P<0.05$). Significant differences in ATTD between Gly and Sul were detectable for Zn and Cu ($P<0.05$). Compared to the basal group retention of Mn and Fe was significantly higher in the liver of Gly-supplemented birds and in the TB of Gly- and Sul-treated animals ($P<0.05$). Retention of Cu in liver and TB, and of Zn in TB, tended to be higher in Gly-group than in basal group ($P<0.1$). The present study confirmed that the trace minerals Fe, Mn, Zn and Cu are available in broilers to a higher amount when supplemented in glycine-bound form instead of sulfates in a deficient situation. The results indicated that the measured parameter influences the conclusions made from bioavailability studies, comparing different trace mineral sources.

**Keywords:** Trace minerals, broiler chickens, performance, digestibility, retention