ABSTRACT: Three experiments were conducted to evaluate the effects of increasing dietary Cu and Zn on weanling pig performance. Diets were fed in 2 phases: phase 1 from d 0 to 14 postweaning and phase 2 from d 14 to 28 in Exp. 1 and 2 and d 14 to 42 in Exp. 3. The trace mineral premix, included in all diets, provided 165 mg/kg of Zn from ZnSO₄ and 16.5 mg/kg of Cu from CuSO₄. In Exp. 1, treatments were arranged in a 2 × 3 factorial with main effects of added Cu from tri-basic copper chloride (TBCC; 0 or 150 mg/kg) and added Zn from ZnO (0, 1,500, or 3,000 mg/kg from d 0 to 14 and 0, 1,000, or 2,000 mg/kg from d 14 to 28). No Cu × Zn interactions were observed (P > 0.10). Adding TBCC or Zn increased (P < 0.05) ADG and ADFI during each phase. In Exp. 2, treatments were arranged in a 2 × 3 factorial with main effects of added Zn from ZnO (0 or 3,000 mg/kg from d 0 to 14 and 0 or 2,000 mg/kg from d 14 to 28) and Cu (control, 125 mg/kg of Cu from TBCC, or 125 mg/kg of Cu from CuSO₄). No Cu × Zn interactions (P > 0.10) were observed for any performance data. Adding ZnO improved (P < 0.02) ADG and ADFI from d 0 to 14 and overall. From d 0 to 28, supplementing CuSO₄ increased (P < 0.02) ADG, ADFI, and G:F, and TBCC improved (P = 0.006) ADG. In Exp. 3, the 6 dietary treatments were arranged in a 2 × 2 factorial with main effects of added Cu from CuSO₄ (0 or 125 mg/kg) and added Zn from ZnO (0 or 3,000 mg/kg from d 0 to 14 and 0 or 2,000 mg/kg from d 14 to 42). The final 2 treatments were feeding added ZnO alone or in combination with CuSO₄ from d 0 to 14 and adding CuSO₄ from d 14 to 42. Adding ZnO increased (P < 0.04) ADG, ADFI, and G:F from d 0 to 14 and ADG from d 0 to 42. Dietary CuSO₄ increased (P < 0.004) ADG and ADFI from d 14 to 42 and d 0 to 42. From d 28 to 42, a trend for a Cu × Zn interaction was observed (P = 0.06) for ADG. This interaction was reflective of the numeric decrease in ADG for pigs when Cu and Zn were used in combination compared with each used alone. Also, numerical advantages were observed when supplementing Zn from d 0 to 14 and Cu from d 14 to 42 compared with all other Cu and Zn regimens. These 3 experiments show the advantages of including both Cu and Zn in the diet for 28 d postweaning; however, as evident in Exp. 3, when 3,000 mg/kg of Zn was added early and 125 mg/kg of Cu was added late, performance was similar or numerically greater than when both were used for 42 d.

Key words: copper, growth, weanling pig, zinc

©2011 American Society of Animal Science. All rights reserved.