Growth-promoting efficacy of pharmacological doses of tetrabasic zinc chloride in diets for nursery pigs

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Received 19 January 2001, accepted 20 April 2001.

Mavromichalis, I., Webe, D. M., Parr, E. N. and Baker, D. H. 2001. Growth-promoting efficacy of pharmacological doses of tetrabasic zinc chloride in diets for nursery pigs. Can. J. Anim. Sci. 81: 387-391. Zinc oxide (ZnO) is a reliable growth-promoting agent in young pigs when added to provide pharmacologic levels of dietary Zn. Tetrabasic zinc chloride (TBZC), whose formula is Zn₅Cl₂(OH)₈, was tested in three experiments as a replacement for Waelz-processed ZnO. In exp. 1, 150 weaned pigs (5.2 kg) in five replicates received 0, 1500, or 3000 mg Zn kg⁻¹ from either ZnO or TBZC in a 21 d growth assay in which antimicrobial agents were not contained in the diet. Both sources of supplemental Zn increased (P < 0.05) weight gain and feed efficiency, but feed efficiency was improved (P < 0.05) to a greater extent by TBZC than by ZnO, particularly at the 1500 mg Zn kg⁻¹ dose level. In exp. 2, 144 weaned pigs (5.1 kg) in eight replicates received either 0 or 1500 mg Zn kg⁻¹ from either ZnO or TBZC in a 19 d growth assay that included an antibacterial agent (carbadox) in all diets. Weight gain did not respond to Zn supplementation, regardless of Zn source, but feed efficiency was improved by TBZC addition to the diet. In exp. 3, 180 weaned pigs (4.5 kg) in five replicates received no supplemental Zn, 3000 mg Zn kg⁻¹ from ZnO, or four incremental doses (750, 1500, 2250 and 3000 mg Zn kg⁻¹) of TBZC in a 21 d growth assay that included carbadox in the basal diet. Supplemental Zn from ZnO at 3000 mg Zn kg⁻¹ increased both weight gain (P < 0.05) and feed efficiency (P < 0.06). Incremental Zn additions from TBZC indicated that both weight gain and gain/feed ratio were increased (P < 0.05) and that 1500 mg Zn kg⁻¹ from TBZC was the optimal dose for this source of Zn. The results of these experiments support the view that TBZC is a very effective source of Zn for enhancing growth performance of newly weaned pigs fed diets with or without an added antimicrobial agent.

Key words: Nursery pigs, zinc oxide, tetrabasic zinc chloride, growth promotion