178 Effects of zinc oxide and microbial phytase on standardized total tract digestibility of calcium in maize-based diets fed to growing pigs.

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It is common industry practice to use diets with pharmacological concentrations of zinc during the post-weaning period to prevent post-weaning diarrhea in pigs. However, Zn competes with Ca for absorption, and Ca and Zn may bind to phytate, which may also affect Ca absorption. Therefore, an experiment was conducted to test the hypothesis that inclusion of Zn at a therapeutic level in diets fed to pigs affects apparent total tract digestibility (ATTD) of Ca and P and standardized total tract digestibility (STTD) of Ca. The second hypothesis was that inclusion of microbial phytase increases the STTD of Ca regardless of the concentration of Zn in the diet. Fifty-six growing barrows (average BW: 15.4 ± 1.9 kg) were allotted to a randomized complete block design with 7 dietary treatments and 8 pigs per treatment. A basal diet containing corn, cornstarch, potato protein isolate, soybean oil, calcium carbonate, monosodium phosphate, vitamins, and minerals was formulated with either 0 or 2400 mg/kg Zn from ZnO and 0, 1000, or 3000 units of phytase (FTU) per kg. A Ca-free diet was used to determine basal endogenous losses of Ca. Feces were collected from the feed provided from d 6 to 11 using the marker-to-marker approach, and urine was also collected. Retention of Ca, ATTD of Ca, and STTD of Ca increased linearly ($P < 0.01$) as the concentration of phytase in the diet increased, but were less if ZnO was used than if no ZnO was added to the diet (interaction, $P < 0.01$). Retention of P and the ATTD of P increased linearly ($P < 0.01$) and quadratically ($P < 0.05$) as the concentration of phytase increased in the diet, but the increase was greater if ZnO was not added than if ZnO was added to the diet (interaction, $P < 0.05$). In conclusion, pharmacological levels of Zn reduced Ca and P digestibility and retention, but this effect was partly mitigated by the inclusion of high levels of phytase in the diets. Inclusion of microbial phytase increased the ATTD and STTD of Ca in diets and also the ATTD of P.

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