existed between sources evaluated.

Key Words: growth performance, nursery pig, zinc

298 Could zinc citrate supplementation during lactation increase the serum Zn levels at weaning?

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Zinc is essential for normal growth and development in all animals. In our previous studies it was observed that weaning causes a decrease in the serum Zn, and that piglets with low BW (5.5 kg) at weaning had lower Zn levels (0.79 mg/L) than piglets with a higher BW (8.63kg; 0.98 mg of Zn/L). It was hypothesized that supplementing with 6 mg/d of Zn (19.35mg of Zn Citrate) during the last 10 d of lactation may improve the Zn status at weaning (d 28), especially in light piglets. A total of 48 piglets were selected from 12 litters (2 piglets/litter categorized as heavy 5.7 ± 0.2 kg BW, and 2 piglets as light 3.9 ± 0.3 kg BW) on Day 18 of lactation. Experimental treatments consisted on the daily administration of a capsule containing either 0 or 6 mg/d of Zn as Zn Citrate for each piglet and BW category in each sow from d 18 to 28 (12 replicates per treatment and BW category). The 6 mg Zn/d was chosen to be similar to the Zn provided in one kg of sow milk. Body weight was individually recorded on d 18 and 28 of lactation and on d 2, 7, and 14 postweaning (d 28). Blood samples were obtained on Day 18 and 28 of lactation. BW and serum Zn levels were analyzed with ANOVA by using the proc mixed procedure of SAS. All piglets had a drop on the serum levels of Zn, from 0.93 mg/L on Day 18 to a 0.74 mg/L on Day 28, which may reflect that suckling was likely limiting Zn intake. No different average serum Zn levels were observed according to the BW category for the entire period (0.85 and 0.82 mg/L for heavy and light piglets, respectively; $P = 0.26$), and neither between animals supplemented and non-supplemented at weaning (d 28) (0.76 vs. 0.71 mg/L Zn, respectively; $P = 0.40$). However, supplemented piglets had quantitatively higher Zn levels. No different performance was observed due to Zn supplementation for the whole period. In conclusion, supplementing 6 mg/d Zn as Zn citrate for the last 10 d of lactation is not sufficient to prevent the decrease in serum Zn during lactation.

Key Words: Piglets, Zinc Citrate, Zinc Status

299 Effect of diet type and added copper on growth performance, carcass characteristics, total tract digestibility, gut morphology, and mucosal mRNA expression of finishing pigs.

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A total of 757 pigs (PIC 337 × 1050; initially 27.6 kg BW) were used in a 117-d experiment to determine the effects of added Cu (TBCC; tribasic copper chloride, IntelliBond C; Micronutrients, Inc., Indianapolis, IN) and diet type on growth performance, carcass characteristics, energy digestibility, gut morphology, and mucosal mRNA expression of finishing pigs. Pens of pigs were allotted to 1 of 4 dietary treatments, balanced on average pen weight in a randomized complete-block design with 26 to 28 pigs/pen and 7 replications/treatment. Treatments were arranged in a 2 × 2 factorial arrangement with main effects of diet type, a corn-soybean meal-based diet (corn-soy) or a high byproduct diet (byproduct) with 30% distillers dried grains with solubles (DDGS) and 15% bakery meal, and added Cu (0 (10 mg/kg basal) or 150 mg/kg added Cu). There were no Cu×diet type interactions for growth performance. Neither added Cu nor diet type significantly influenced overall growth performance, although adding Cu during the early finishing period tended to increase ($P = 0.076$) ADG compared to pigs fed none (0.85 vs. 0.83). However, NE caloric efficiency was improved ($P = 0.001$) for pigs fed the corn-soy diet compared to the byproduct diet (6.76 vs. 7.15 Mcal intake/kg BW gain). Pigs fed the corn-soy diet had improved carcass yield ($P = 0.007$; 74.33 vs. 73.19%) and HCW G:F ($P = 0.011$; 0.274 vs. 0.266), and tended to have increased HCW ($P = 0.067$; 94.60 vs. 92.65 kg) and HCW ADG ($P = 0.056$; 0.635 vs. 0.615 kg/d) compared to pigs fed the byproduct diet. A Cu×diet type interaction ($P < 0.05$) existed for DM and GE digestibility in phase 2 as added Cu improved digestibility of DM and GE in the corn-soy diet, but not in the byproduct diet. In phase 4, added Cu tended to increase DM and GE digestibility ($P = 0.060$) while pigs fed the byproduct diet had decreased DM and GE digestibility ($P = 0.001$) compared to the corn-soy diet. For gut morphology, pigs fed added Cu had decreased distal small intestine crypt depth ($P = 0.017$; 207 vs. 225 um) compared to those fed no added Cu. Furthermore, pigs fed added Cu had decreased ($P = 0.032$; 0.618 vs. 0.935) relative mRNA expression of intestinal fatty acid binding protein (iFABP) compared to those fed no added Cu. In summary, 150 mg/kg added TBCC did not significantly affect overall growth but did influence diet digestibility and some gut morphology or mRNA expression measurements. Feeding a high byproduct diet decreased yield, caloric efficiency, and diet digestibility.

Key Words: finishing pigs, copper, fiber