

Evaluation of Zinc and Copper Levels in Nursery Feeds

Performance responses to high levels of zinc (Zn) and copper (Cu) in nursery feeds are well documented. Akey recently increased Zn levels in its prestarter feeds (Akey Pig 3000, 2000 and 1300) from 2400 to 3000 ppm. Cu was maintained at 235 ppm in these diets. Because of the combined increase in mineral content during the prestarter phase, we decided to summarize our research that evaluated Cu levels in the presence of high Zn in prestarter and starter feeds.

In an initial trial, we observed typical growth responses to either Cu or Zn, but no beneficial responses to having both high Cu and high Zn levels in Phase 1 prestarter feeds. In a follow up study, using high Cu in the presence of 3000 ppm Zn in Phase 1 depressed growth performance (Table 1).

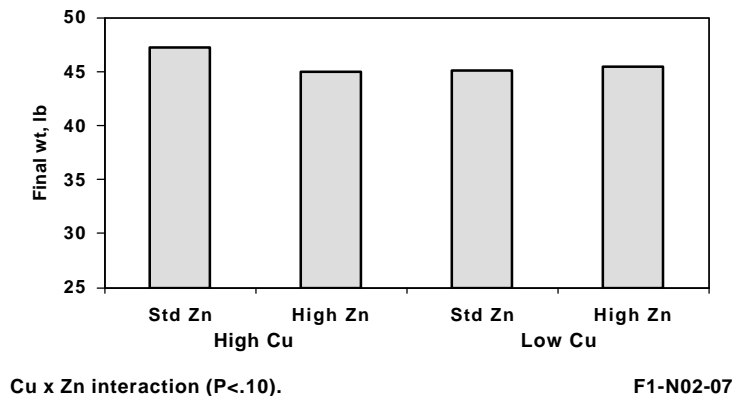
Table 1. Interactive Effects of Cu and Zn Levels on Nursery Pig Performance

Item	---Phase 1---			
	High Cu		Low Cu	
	High Zn	High Zn	High Zn	High Zn
ADG, lb	.52	.54	.60	.61
ADFI, lb	.50	.52	.59	.60
F/G	.95	.98	.97	.99
Item	---Phase 2---			
	High Cu		Low Cu	
	Standard Zn	High Zn	Standard Zn	High Zn
ADG, lb	.66	.60	.54	.56
ADFI, lb	.78	.75	.73	.75
F/G	1.17	1.27	1.33	1.35
Item	---Overall---			
	High Cu		Low Cu	
	Standard Zn	High Zn	Standard Zn	High Zn
ADG, lb	1.00	.95	.95	.96
ADFI, lb	1.27	1.25	1.24	1.28
F/G	1.26	1.32	1.30	1.33

In Phase 1, pigs fed low Cu in the presence of 3000 ppm Zn had higher ADFI, ADG and final wt ($P < .01$) vs. pigs fed high Cu (Table 1). Since all pigs were fed high levels of Zn in Phase 1, there was no Zn effect or interaction with Cu level. A Cu x Zn interaction ($P < .05$) was detected in Phase 2 for ADG. Pigs fed standard Zn levels (1950 ppm) had a much larger response to Cu than pigs fed high Zn (3000 ppm) (Table 1).

Overall, feeding high Zn through Phase 4 resulted in poorer F/G ratios ($P < .01$) and higher feed cost/lb of gain (data not shown) vs. standard Zn levels (Table 1). Feeding high Cu throughout the nursery period resulted in an improvement in F/G ratio ($P < .05$) and lower feed cost per lb of gain (data not shown). Pigs fed standard Zn levels had increased ADFI, ADG and final body weight in response to high Cu, while those fed high Zn had slight reductions in ADG, ADFI (Table 1) and final weight (Figure 1) in response to high Cu (Cu x Zn interaction, $P < .10$). Pigs fed standard Zn in the presence of high Cu levels had the best gain, intake and final body weight of all treatments.

Figure 1. Interactive Effects of Cu and Zn on Final Wt (Overall)



This study showed that pigs fed 3000 ppm Zn in Phase 1 should not be fed high levels of Cu simultaneously. As Zn level is decreased to 1950 ppm in Phase 2, and to 150 ppm in Phases 3 and 4, pigs respond positively to high Cu levels.

Pigs fed standard Zn levels with high Cu (260 ppm) had the best overall performance vs. all other treatments. Enhanced performance in Phase 1 was achieved by removing high Cu and feeding high Zn only, followed by standard Zn and high Cu in Phase 2, followed by high Cu only in Phases 3 and 4.

Based on these data, Akey will no longer feed high Cu levels in Phase 1 prestarter feeds (Pig 3000, Pig 2000 or Pig 1300). Producers may note a change (lightening) in stool color due to the absence of high Cu in these diets, which is normal and expected. Beginning in Phase 2 (Prestart 650), stool color will darken due to high Cu levels as per our standard program. Stools will remain dark throughout the nursery and grower periods, including feeds containing Gro Booster.

If you have questions about these diet changes, please contact your Akey Account Manager or the Technical Staff at (800) 392-8324.