

	Cu, ppm		P<	CTC, ppm		P<	SEM
	0	200		0	440		
d 0 to 14							
ADG, g	271	294	0.025	262	303	0.001	7.9
ADFI, g	362	388	0.011	360	390	0.004	7.0
G:F	0.750	0.756	0.546	0.728	0.778	0.001	0.009
d 14 to 28							
ADG, g	596	600	0.693	574	622	0.001	7.6
ADFI, g	884	895	0.386	857	922	0.001	11.8
G:F	0.674	0.671	0.518	0.671	0.675	0.486	0.004

fed for 7 d after weaning. Pens were allotted to dietary treatments based on BW and location in a randomized complete block design with 5 pigs per pen and 8 replications per treatment (each replication as a pair of adjoining pens). Treatments were a 2 × 2 factorial with added Cu (0 vs. 200 ppm Cu sulfate) and CTC (0 vs. 440 ppm). Data were analyzed using a linear mixed model (PROC GLIMMIX, SAS®). There was no evidence for interactive effects of Cu and CTC on growth performance. From d 0-14, added Cu increased ($P<0.05$) ADG and ADFI and added CTC improved ($P<0.01$) ADG, ADFI, and G:F. From d 14-28, addition of CTC to the diet improved ($P<0.01$) ADG and ADFI, but there was no evidence for Cu effect. Overall, d 0-28, pigs fed diets with CTC had improved ($P<0.05$) ADG, ADFI, and G:F, but there was no evidence for Cu effect. The inclusion of Cu or CTC increased ($P<0.05$) BW on d 14 (11.2 vs. 11.5 kg, for Cu; 11.1 vs. 11.6 kg, for CTC) and d 28 (19.5 vs. 20.0 kg, for Cu; 19.2 vs. 20.3 kg, for CTC). In conclusion, these findings characterize a beneficial effect of feeding Cu for 14 d on growth performance of young pigs (7-12 kg BW) and a growth promoting effect of therapeutic levels of CTC in nursery diets. The lack of interactive effects between Cu and CTC suggests the responses on growth performance of nursery pigs are similar when fed alone or in combination.

Key Words: chlortetracycline, weanling pig, copper

224 Evaluation of Elarom SES with or without Tribasic Copper Chloride on Nursery Pig Growth Performance.

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Weanling pigs (n=360, initially 6.0 ± 0.13 kg BW) were used in a 42-d study evaluating the effects of feeding Elarom SES in combination with increasing tribasic copper chloride on growth performance and fecal consistency. Elarom SES (Trouw Nutrition USA, Highland,

	-Elarom SES			+Elarom SES			SEM
	TBCC, ppm			TBCC, ppm			
	0	108	183	0	108	183	
d 0 to 21							
ADG, g	241	262	256	245	253	248	12.26
G:F	0.773	0.810	0.793	0.799	0.780	0.802	0.015
d 21 to 42							
ADG, g	610	621	612	604	631	638	13.29
G:F	0.667	0.67	0.655	0.667	0.673	0.680	0.008
d 0 to 42							
ADG, g	425	441	433	424	440	443	10.69
G:F ^a	0.694	0.706	0.691	0.700	0.701	0.710	0.006

^aElarom SES×TBCC (quadratic; $P=0.058$)

IL) is a proprietary blend of functional ingredients designed to enhance growth performance and gut health. Tribasic copper chloride (TBCC, Intellibond C, Micronutrients USA, LLC., Indianapolis, IN) is a form of Cu that has the potential for improved bio-availability and enhanced growth performance. Pigs were weaned at approximately 21 d and allotted to pens based on initial BW in a completely randomized block design with 5 pigs per pen and 12 replications per treatment. Experimental diets were fed in 3 phases (Phase 1, d 0 to 7; Phase 2, d 7 to 21; and Phase 3, d 21 to 42 post-weaning) in meal form. Treatments were arranged as a 2 × 3 factorial with main effects of Elarom SES (none vs. 0.2% in all phases) and TBCC (none, 108, or 183 ppm of Cu in Phase 3 only). Pen fecal consistency score was determined on d 0, 4, 7, 14, 21, 28, 35, and 42 on a scale from 1 to 5. A score of 1 indicated hard, pellet type feces and a score of 5 indicated watery, liquid feces. All diets contained 17 mg/kg of Cu from the trace mineral premix. Overall, there was no evidence for treatment differences observed for ADG, ADFI, or fecal consistency; however, a marginal effect for an Elarom SES×TBCC interaction was observed for G:F (quadratic, $P=0.058$). This was the result of G:F improving at the intermediate level of TBCC without Elarom SES, yet G:F was improved at the highest level of TBCC when Elarom SES was present. Overall, no consistent benefit was observed from feeding Elarom SES or different levels of TBCC on growth performance or fecal consistency of weaned pigs.

Key Words: feed additive, growth performance, nursery

225 Effects of Zinc Oxide, Zinc Hydroxychloride, and Tribasic Copper Chloride on Nursery Pig Growth Performance.

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