

this study exhibited no detrimental effects on the health status and growth performance of newly weaned piglets with no beneficial effects being observed.

Key Words: feed additive, feed efficiency, weaner pig
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156 Effect of different phase level of medium chain triglycerides on growth performance, excreta microflora, and blood profiles in broilers. J. Hu*, J. Y. Zhang, S. D. Upadhaya, I. H. Kim, *Department of Animal Resource and Science, Dankook University, Cheonan, South Korea.*

In the past several decades, antibiotics have been widely used in livestock and poultry, to significantly improve growth performance and animal health, and to protect animals from pathogenic microorganisms. This study was conducted to investigate the effect of different phase levels of MCT on growth performance, excreta microflora, and blood profiles in broilers for the possibility of alternative antibiotics. A total of 1125 ROSS 308 mixed-sex broilers with an average initial body weight (BW) 49 ± 0.79 g (1 d of age) were used in this trial. They were randomly assigned to 3 treatments, with 15 birds of 25 replications in each treatment of the following: CON (Basal diet); MCT1 (Starter, Grower, Finisher: Basal diet+0.1%, 0.075%, 0.05% of MCT), MCT2 (Starter, Grower, Finisher: Basal diet+0.1%, 0.1%, 0.1% of MCT). The experiment was conducted in 3 phases consisting of starter phase (from d 1 to 7), grower phase (from d 7 to 21), and finisher phase (from d 21 to 28). All data were statistically analyzed using the General Linear Model (GLM) procedure of the SAS program (SAS Inst. Inc., Cary, NC). Orthogonal contrasts were used to test the effect of differences between of CON, MCT1, and MCT2 (CON vs. MCT1&2, MCT1 vs. MCT2). The pen was used as an experimental unit for the productivity, blood profile, and excreta microflora measurements. A criterion α level of $P < 0.05$ was used to determine statistical significance. Results indicate that BWG was improved by 2.4% (MCT1) and 1.5% (MCT2), and FCR was decreased by 3.1% (MCT1) and 2.2% (MCT2) in broiler fed MCT compared with CON in the overall experiment phase ($P = 0.070$, $P = 0.087$, respectively). There was no difference in the concentration of white blood cells, IgG, and lymphocyte, and excreta microflora having no effect was observed among treatments. Therefore, we suggested that MCT could be used in broiler dietary and supplementation at 0.1% feed which may be suitable in the diet of broilers during d 7-d 21.

Key Words: broilers, growth performance, medium-chain triglycerides
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157 Effects of KemTRACE Cr level and feeding regimen on finishing pig growth performance and carcass characteristics. J. T. Gebhardt¹, J. C. Woodworth¹, M. D. Tokach¹, S. S. Dritz¹, J. M. DeRouchey¹, J. A. Loughmiller², R. D. Goodband¹, ¹*Kansas State University, Manhattan*, ²*Kemin Industries, Des Moines, IA.*

A study was conducted to determine the effects of increasing Cr (KemTRACE Chromium propionate, Kemin Industries Inc., Des Moines, IA) and feeding regimen on growth and carcass performance of finishing pigs housed in a commercial environment. A total of 1206 pigs (PIC 337 \times 1050; initial BW = 28.67 kg) with 27 pigs/pen and 9 pens/treatment were used in a 125 d study. Pigs were split by gender on arrival at the facility, with 4 blocks of each gender and a final mixed gender block. Gender blocks were randomly allotted to groups of 5 pen locations within the barn. Block was included in the generalized linear mixed model (PROC GLIMMIX; SAS Inst. Inc., Cary, NC) as a random effect and accounted for gender, initial BW, and barn location. Diets were corn-soybean meal-dried distiller grains with solubles-based and were fed in 5 phases. All nutrient concentrations met or exceed NRC (2012) requirement estimates. Treatments were arranged as a $2 \times 2+1$ factorial with two levels of Cr supplementation (100 or 200 μ g/kg) fed during two growth phases (grower = 63-139 kg; finisher = 63 to 139 kg) and a control diet containing no added Cr. There was no effect of changing Cr supplementation during the finishing period. Therefore, only linear and quadratic effects of increasing Cr within period were considered using all treatments, as well as linear and quadratic effects of increasing Cr for the full duration using the 3 treatments which maintained a constant Cr concentration throughout. Increasing Cr during the grower period reduced (quadratic, $P < 0.001$) ADG and G:F. During the finisher period, increasing Cr tended (quadratic, $P < 0.058$) to increase G:F with the best G:F observed in pigs fed 100 μ g/kg Cr. Overall, increasing Cr had no impact on ADG or ADFI; however, G:F was maximized (quadratic, $P < 0.020$) when pigs were fed 100 μ g/kg of Cr. Carcass characteristics were not influenced ($P > 0.10$) by added Cr or feeding regimen. In summary, increasing Cr supplementation up to 100 μ g/kg elicited improvement in G:F with no impact on ADG, ADFI, or carcass characteristics.

Key Words: Chromium propionate, duration, pigs
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Table 157. Effect of added Cr on pig performance, d 0 to 125

Grower added Cr, µg/kg:	0	100	200	100	200	Probability, <i>P</i> <		
Finisher added Cr, µg/kg:	0	100	200	200	100	SEM	Linear	Quadratic
ADG, kg	0.89	0.90	0.89	0.90	0.89	0.009	0.796	0.136
ADFI, kg	2.23	2.21	2.21	2.23	2.23	0.037	0.472	0.651
G:F	0.400	0.408	0.402	0.404	0.402	0.004	0.463	0.020

158 Interactive effects of KemTRACE Cr and Micro-Aid on finishing pig growth performance and carcass characteristics.

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A study was conducted to determine the interactive effects of Cr (KemTRACE Chromium propionate, Kemin Industries Inc., Des Moines, IA) and Micro-Aid (*Yucca schidigera*-based product supplied by Distributors Processing Inc., Porterville, CA) on growth carcass performance of finishing pigs housed in a commercial environment. There were 1188 pigs (PIC 337 × 1050; initial BW = 27.3 kg) with 27 pigs/pen and 11 pens/treatment. Pigs were split by gender on arrival at the facility, with 5 blocks of each gender and a final mixed gender block. Gender blocks were randomly allotted to groups of 4 pen locations within the barn. Block was included in the statistical model as a random effect and accounted for gender, initial BW, and barn location. Diets were corn-soybean meal-dried distillers grains with solubles-based and were fed in 5 phases. Diets were formulated to meet or exceed NRC (2012) requirement estimates. Treatments were arranged as a 2 × 2 factorial with main effects of Cr (0 or 200 µg/kg) or Micro-Aid (0 or 62.5 mg/kg). No Cr × Micro-Aid interactions were observed. Overall, ADG and G:F were not influenced by treatment. Adding Micro-Aid tended to increase (*P* = 0.077) and adding Cr increased (*P* = 0.049) ADFI. For carcass characteristics, HCW, loin depth, and carcass yield percentage were not influenced by treatment. Backfat depth tended to increase (*P* = 0.055) and lean percentage was decreased (*P* = 0.014) when Cr was included in the diets. In summary, no synergistic effects were observed from feeding Cr and Micro-Aid in diets fed to finishing pigs housed in a commercial environment. Only marginal differences in ADFI were observed from adding either Cr or Micro-Aid. Finally, diets containing Cr were associated with carcasses having more backfat and less lean.

Key Words: Chromium propionate, Micro-Aid, pigs
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Table 158. Interactive effects of Cr and Micro-Aid on finishing pig growth and carcass performance.

Added Cr, µg/kg	0	200	0	200	Probability, <i>P</i> <	
Micro-Aid, mg/kg	0	0	62.5	62.5	Cr	Micro-Aid
ADG, kg	0.87	0.87	0.87	0.88	0.446	0.490
ADFI, kg	2.22	2.26	2.26	2.30	0.049	0.077
G:F	0.39	0.39	0.39	0.38	0.115	0.178
BF, mm	16.97	17.69	17.26	17.54	0.055	0.787
Lean, %	56.89	55.92	56.83	56.54	0.014	0.261
Yield, %	74.51	75.23	75.27	75.44	0.302	0.254

SEM = ADG (0.009), ADFI (0.047), G:F (0.006), BF (0.639), lean% (0.408), and yield% (0.456)

159 Supplemental effects of fermented rice bran extracts on growth performance, bone characteristics, and immune response of broiler chickens.

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The objective of this experiment was to evaluate the supplemental effects of fermented rice bran extract (FBE, Maxcell Co., Los Angeles, CA) on growth performance, bone characteristics, and immune response in broiler chickens. FBE was produced from a fermentation process using rice bran and sucrose sources as medium inoculated by a mixture of probiotics (*Lactobacillus plantarum*, *Bacillus subtilis*, and *Saccharomyces cerevisiae*) producing metabolites. A total of 270 1-d-old male broiler chickens were used in a completely randomized design with 3 dietary treatments and 9 replicate cages of 10 birds per cage for each treatment. Broilers were fed a basal diet supplemented with FBE at the level of 0, 2.5, or 5 g/kg, respectively for 42 d based on 3 dietary phases. Body weight and feed consumption were recorded weekly. Ileal mucosa samples were collected for analysis of immune response and left tibias were removed for measuring bone characteristics. Data were analyzed using the GLM procedure of SAS. Increasing levels of FBE improved feed conversion ratio (FCR) (1.88 to 1.75, linear, *P* < 0.05) from d 29 to 42. During the whole experimental period, increasing levels of FBE decreased feed intake (4448 to 4121 g/bird, quadratic, *P* < 0.05), and tended to improve FCR (1.81 to 1.70, linear, *P* = 0.082) without affecting body weight gain. Increasing levels of FBE tended to increase tibia breaking strength (18.0 to 23.7 N/g, linear, *P* = 0.098). Supplementation of FBE did not affect the concentrations of immunoglobulin A, immunoglobulin G, and tumor necrosis factor-α in the ileal mucosa. In conclusion, dietary supplementation of FBE may improve