

Nonruminant Nutrition: Mineral

TH119 Impact of massive doses of copper or zinc on growth performance and nutrient digestibility of newly weaned piglets.

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This study was conducted to evaluate the impact of massive dose of copper (Cu) or zinc (Zn) on the growth performance and digestive capacity of newly weaned piglets. Twenty three castrated male piglets, (7.4 kg) were used for the growth and digestibility studies. The three post-weaning diets were formulated according to NRC and only Zn or Cu was supplemented according dietary treatment: 1) Control diet (C): 25 ppm Cu and 134 ppm Zn; 2) Cu diet: 135 ppm Cu and 123 ppm Zn; 3) Zn diet: 28 ppm Cu and 2,343 ppm Zn. The pigs were individually fed with specific diet for 12 days. Feed intake was daily determined and pig weight was evaluated on d0, 8 and 12. On d8, chromic oxide (0.25%) was added to diets as indigestible marker. The faeces and urine were collected during d9 to 12 to evaluate the digestibility and retention of nitrogen, energy, phosphorus and calcium. Results showed that Cu supplementation improved (P<0.05) ADG, ADFI et G:F (P<0.05) and Zn supplementation tended to increase ADG and G:F (P<0.09) during the overall period of d0 to 12 compared to Control diet. During d8 to 12, Zn and Cu supplementations were increased ADG, ADFI and G:F (P<0.05). During collect period, Cu supplementation was increased total absorption and retention of nitrogen, energy and phosphorus (P<0.05). Zn supplementation was also increased total absorption and retention of energy (P<0.05) and tended to increased absorption and retention of nitrogen and phosphorus (P<0.09). However, Zn and Cu supplementations did not have any effect on digestibility and retention:ingestion ratio of nitrogen, energy and phosphorus. For calcium, Zn and Cu supplementation did not have any effect on total absorption and retention but reduced the retention:ingestion ratio (P<0.05). These results suggest that the effect of Zn and Cu supplementations on growth performance (ADG, ADFI, G:F) can not be associated to better nutrient digestibility and retention efficiency.

Key Words: Piglet, Zinc, Copper

TH120 Effect of different Ca and P level on early growth of fast-growth lines of Wulong Goose.

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Two hundred and eighty-eight 1-day-old Wulong geese of Fast-growth Lines were selected to be fattened respectively in netting bed, and then divided into eight groups with three replications in each group, twelve geese for each replication. The basal diets were added with different contents of Ca and NPP (non-Phytate Phosphorus) in a completely randomized design involving a 4 × 2 factorial arrangement of treatments. Ca and NPP were added with pure CaCO₃ and NaH₂PO₄. The result suggested that, during the early period (0-4week), the proportion of Ca and NPP had significant influence on its growth (P < 0.05), the most absolutely increasing was 1168±95.6g in the four weekend when the dietary level of Ca was 0.65% and NPP was 0.30% (the proportion of Ca and NPP was 2.17:1), and the least absolutely increasing was 820±33.3g when the dietary level of Ca was 0.55% and NPP was 0.40% (the proportion of Ca and NPP was 1.38:1), so were the eviscerated weight with giblet ratio (1871±85 and 1473±99) and feed/gain (F/G)

(2.24±0.36 and 1.90±0.41). But the alkaline phosphatase (AKP) activity was not significantly affect by the Ca and NPP level (P > 0.05). The Wulong geese grew well at the proportion between 1.88:1 and 2.50:1, and grew worst at 1.38:1.

Key Words: Wulong Goose, Ca, NPP

TH121 Effects of dietary *Escherichia coli* phytase supplementation on growth performance, carcass quality and excretion of copper and zinc concentrations in finishing pigs.

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This study was conducted to evaluate the effects of dietary *Escherichia coli* phytase supplementation on growth performance, carcass quality and excretion of copper and zinc concentrations in finishing pigs. The total of seventy two [(Landrace×Yorkshire) × Duroc] pigs (65.43±0.72 kg in average initial body weight) were used in 56 days assay. Dietary treatments included 1) CON (basal diet) 2) P5 (basal diet + phytase 0.05%) and 3) P10 (basal diet + phytase 0.1%). There were three dietary treatments with six replicate pens per treatment and four pigs per pen. During the overall periods, ADFI (Average daily feed intake) was increased (P<0.05) in phytase supplementation treatments (2.752 and 2.751 kg) compared to CON treatment (2.566 kg). At the 5th week, dry matter, nitrogen and ash digestibilities were higher (P<0.05) in P5 treatment (73.59, 84.12 and 33.71%, respectively) than in CON (66.43, 74.16 and 14.29%, respectively) and P10 treatments (71.19, 80.95 and 26.50%, respectively) and CON treatment (74.16%) showed the lowest (P<0.05) effect on nutrition digestibility. However, phosphorus digestibility was higher (P<0.05) in both phytase supplementation treatments (66.76 and 63.15%) than in CON treatment (47.58%). The pH of *M. logissimus dorsi* was significantly higher (P<0.05) in CON treatment (5.72) than phytase supplementation treatments (5.57 and 5.58). L* value of *M. logissimus dorsi* muscle color was significantly increased (P<0.05) in P10 treatment (57.25) compared to CON (54.94) and P5 treatments (54.32). Also, a* value was increased (P<0.05) in CON treatment (16.89) compared with phytase supplementation treatments (16.18 and 16.65). However, excretion of copper and zinc concentrations were no difference among the treatments. In conclusion, the results of the experiment was affected by dietary *Escherichia coli* phytase supplementation on ADFI, digestibilities, pH and color of meat in finishing pigs.

Key Words: *Escherichia coli* Phytase, Growth Performance, Excretion of Copper and Zinc Concentrations

TH122 Effects of rare earth supplementation on growth performance, blood immunological parameters, meat quality and fecal odor emission gases in finishing pigs.

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This study was conducted to evaluate the effects of rare earth supplementation on growth performance, blood immunological parameters,

meat quality and fecal odor emission gases in finishing pigs. The total of sixty four [(Landrace×Yorkshire)×Duroc] pigs (65.42±1.16 kg in average initial body weight) were used in 10 weeks assay. Dietary treatments included 1) NC (antibiotic free diet), 2) PC (NC diet + 6 weeks 44ppm of tylosin/ 4 weeks 22ppm of tylosin) 3) RE1 (NC diet + 100ppm of RE), 4) RE2 (NC diet + 200ppm of RE). There were four dietary treatments with four replicate pens per treatment and four pigs per pen. During the overall periods, there were no significant differences in ADG (Average daily gain), ADFI (Average daily feed intake) and gain/feed ratio among treatments ($P>0.05$). Dry matter and nitrogen digestibility were higher in RE2 treatment than other treatments ($P<0.05$). Also, energy digestibility was higher in RE2 treatment than PC and RE1 treatments ($P<0.05$). At the 6th week WBC (white blood cell) was significantly increased ($P<0.05$) in RE1 treatment than NC and RE2 treatments. L^* value of *M. logissimus dorsi* muscle color was significantly increased ($P<0.05$) in rare earth supplementation treatments compared to NC treatment ($P<0.05$). In fatty acid contents of leans, total MUFA was significantly higher in RE2 treatment than others treatments ($P<0.05$). Also, total UFA was significantly increased in RE2 treatment compared with NC and PC treatments ($P<0.05$). In fatty acid contents of fats, total SFA of rare earth supplementation treatments were lower than in PC treatments ($P<0.05$). UFA:SFA ratio was significantly higher in rare earth supplementation treatments than PC treatment ($P<0.05$). In fecal odor emission, NH_3 was significantly decreased ($P<0.05$) in rare earth supplementation treatments compared to NC and PC treatments. In conclusion, the results of the experiment was affected by rare earth supplementation on digestibilities, meat quality, fatty acid and fecal odor

Key Words: Rare Earth, Growth Performance, Fecal Odor Emission Gases

TH123 The effect of different copper (inorganic and organic) and fat (tallow and glycerol) sources on growth performance, nutrient digestibility, and fecal excretion profile in growing pigs (regional study). Y. Huang^{*1}, J. S. Yoo¹, H. J. Kim¹, Y. J. Chen¹, J. H. Cho¹, Y. K. Han², and I. H. Kim¹, ¹Dankook University, Cheonan, Chungnam, Korea, ²Sungkyunkwan University, Suwon, Korea.

A 2 × 2 trial was conducted to investigate the effect of different copper (inorganic and organic) and fat (tallow and glycerol) sources on growth performance, nutrient digestibility, gas emission, diarrhea appearance, and fecal Cu concentration in growing pigs. The trial used 96 pigs (63 d of age) with an average initial weight of 28.36 ± 1.14 kg. Pigs were assigned to four treatments: 1) basal diet with 134 ppm Cu (Korea recommendation) as CuSO₄ + tallow; 2) basal diet with 134 ppm Cu as CuSO₄ + glycerol; 3) basal diet with 134 ppm Cu as CuMet + tallow; 4) basal diet with 134 ppm Cu as CuMet + glycerol. During the entire experimental period, there were no differences among treatments in the magnitude of improvement for ADG (average daily gain), ADFI (average daily feed intake) and G/F (gain: feed) ratio. Nitrogen (N) digestibility of pigs fed diets with organic copper was improved compared with those of pigs fed diets with inorganic copper ($P<0.05$). The interaction of Cu × fat was observed on both nitrogen ($P<0.05$) and energy ($P<0.01$) digestibilities. Ammonia emission was significantly lower in organic copper added treatments than inorganic copper added treatments ($P<0.05$). Mercaptan and hydrogen sulfide emission were decreased by the addition of glycerol ($P<0.05$). Neither main effects of Cu or fat source nor their interaction was observed on diarrhea appearance during all the experimental period. The copper concentration in feces was significantly lower in organic copper source treatments than

that in inorganic copper source treatments ($P<0.05$). The result of this experiment indicate that substitute organic copper for inorganic copper in diet has less fecal Cu excretion, while it has no effect on the growth performance. The different fat (tallow and glycerol) source have interaction with different copper source on nutrient digestibility. Glycerol supplementation could decrease sulfuric odorous compound concentrations in different source of Cu.

Key Words: Copper, Fat Source, Growing Pig

TH124 The effects of 200 ppb added chromium from chromium propionate on the growth performance and carcass characteristics of finishing pigs. J. R. Bergstrom^{*1}, M. D. Tokach¹, S. S. Dritz¹, J. L. Nelssen¹, R. D. Goodband¹, J. M. DeRouchey¹, J. D. Hahn², and F. R. Valdez², ¹Kansas State University, Manhattan, ²Kemin Industries, Inc., Des Moines, IA.

A total of 1,207 pigs (initial BW = 30.7 kg; PIC, 337×1050) were used in a 103–d experiment to evaluate the effects of 200 ppb Cr from KemTRACE[®] (KemTRACE[®] is a registered trademark of Kemin Industries, Inc.) brand Chromium Propionate (CrPr) on growth performance and carcass characteristics. There were 22 pens per treatment with 25 to 28 pigs per pen evaluating CrPr from d 0 to 84; and 11 pens per treatment evaluating CrPr (0 and 200 ppb) and Paylean[®] (0 and 10 ppm) in a split–plot arrangement from d 84 to 103. Pigs were randomly allotted to a corn–soybean meal–based diet with 3% added choice white grease (control diet) or the control diet with 200 ppb Cr from CrPr. Treatments were fed in three 4–wk phases (d 0 to 28, 28 to 56, and 56 to 84). On d 84, pigs fed the control or Cr treatment were allotted to a fourth dietary phase containing either 0 or 10 ppm Paylean[®]. For the d 0 to 84 period, growth performance of pigs fed the control or 200 ppb CrPr was not different (915 vs 916 g/d ADG). From d 84 to 103 and overall (d 0 to 103), pigs fed diets containing Paylean[®] had increased ($P<0.01$) ADG (1143 vs 969 g/d and 951 vs 926 g/d, respectively) and final weight (128.3 vs 124.5 kg). However, a CrPr × Paylean[®] interaction ($P<0.04$) was observed for d 84 to 103 ADFI and G:F and overall (d 0 to 103) G:F. From d 84 to 103, adding Paylean[®] to the control reduced ADFI (2833 vs 2711 g/d); whereas, adding Paylean[®] to diets containing CrPr increased ADFI (2744 vs 2845 g/d). Added CrPr alone increased G:F from d 84 to 103 (0.35 vs 0.34) and overall (0.393 vs 0.387) compared to the control; whereas, pigs fed both Paylean[®] and CrPr had lower G:F than those fed Paylean[®] alone from d 84 to 103 (0.41 vs 0.42) and overall (0.397 vs 0.403). Neither Paylean[®] or CrPr influenced any of the carcass characteristics measured. Using the high energy diets in this trial, there was no observed response to the dietary inclusion of Cr from CrPr in grow–finish pigs.

Key Words: Chromium, Lysine, Ractopamine HCl

TH125 Evaluation of organic and inorganic trace minerals for pigs. Y. L. Ma^{*}, M. D. Lindemann, G. L. Cromwell, R. B. Cox, and G. Rentfrow, University of Kentucky, Lexington.

Crossbred pigs weaned at 21 ± 3 d (n = 144; BW = 7.4 ± 0.28 kg) were used to assess an organic form of several trace minerals to standard inorganic forms on performance and meat quality when trace minerals were deleted for various times preslaughter. Pigs were allotted to 24

pens (6 pigs/pen) based on gender and BW and fed a diet containing either inorganic ($\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$, ZnO , $\text{FeSO}_4 \cdot \text{H}_2\text{O}$, MnO) or organic (Bioplexes®; Alltech Inc., Nicholasville KY) trace minerals (Cu, Zn, Fe, Mn) at the NRC (1998) requirement for each of 5 phases of BW from 7 to 120 kg (equivalent to 14, 14, 42, 28, 42-d periods, respectively). The pigs were weighed bi-weekly throughout the 140-d experiment. Two pigs were removed from each pen at the end of Phase IV (BW = 82.6 ± 0.80 kg), and again at the end of Phase V (BW = 126.6 ± 3.08 kg) for the determination of carcass measurements and collection of tissue samples (heart, liver, kidney, and spleen). After Phase IV, 3 pens from each treatment were switched to a common diet without trace mineral supplementation in 2-wk intervals. This resulted in 4 groups within each mineral treatment in which trace mineral supplementation was deleted for 0, 2, 4, and 6 wk of Phase V. ADG, ADFI, and G:F were not affected ($P > 0.27$) by the treatments during the first 4 phases (inorganic vs. organic: 773 vs. 778 g/d, 1,680 vs. 1,708 g/d, and 0.461 vs. 0.456, respectively). ADG for all phases was also not affected (inorganic vs. organic: 858 vs. 864 g/d, $P = 0.69$). Tissue weights, carcass shrink, LEA, and 10th rib BF were not affected by the source of mineral or length of mineral deletion ($P > 0.32$). Loin chop 48-hr drip loss was linearly decreased (6.43, 5.79, 6.54, 4.43%, $P = 0.06$) as the duration of mineral deletion was increased. Mineral deletion resulted in a quadratic effect for the Hunter L* color scores (d 0: 54.1, 56.3, 57.4, 55.2, $P < 0.05$; and d 6: 56.6, 57.9, 59.1, 57.3, $P = 0.08$) and the d 6 a* score (10.6, 10.3, 9.9, 10.6, $P = 0.08$). The results failed to show an effect of trace mineral source on growth performance or carcass characteristics; however, some aspects of meat quality were affected by the duration of mineral deletion.

Key Words: Trace Minerals, Pigs

TH126 Iron status evolution of weaned piglets fed different iron sources. P. Schlegel^{*1}, S. Durosoy¹, and M. Dupas², ¹*Pancosma S.A., Geneva, Switzerland*, ²*IDENA, Sautron, France*.

Three hundred eighty four (384) twenty-one day old weaned piglets (Large White*Landrace)*(Large White*Pietrain) were assigned on BW, gender and litter origin to 32 slotted pens. Piglets were fed ad-libitum a basal weaner diet (day 0-21) followed by a basal starter diet (day 21-42). Weaner and starter basal diets were formulated on wheat, barley, soy and contained 11.2 and 10.2 MJ/kg NE, 19.7 and 17.7 g/kg CP, respectively. Basal diets were not iron-supplemented. Dietary treatments were: basal weaner and starter diets supplemented with 100 mg/kg Fe from FeSO_4 or supplemented with 100 mg/kg Fe from crystalline iron glycinate (FeGly, B-TRAXIM® 2C Fe, Pancosma S.A., Switzerland). Prior study, piglets had free access to a commercial creep feed and were injected with 100 mg of iron dextran. Blood samples were collected on two identified piglets (one female, one castrated male) per pen on days 0, 21 and 42 for Hemoglobin (Hb) and hematocrit (Ht) analysis and red blood cell count (RBC). Between day 0 and 21 Hb was measured every second day using Hemocue® kit. Initial Hb, Ht and RBC were similar between treatments. The Hb evolution for the first 21 days was variable over time (day effect: $p < 0.10$). Hb depressions occurred during the first two days and between day 14 and 18 when compared with initial values. The Hb evolution from d0 to 21 was different between dietary treatments ($p < 0.05$) whereas Hb was hardly above 8 g/dl with FeSO_4 and hardly below 8 g/dl with FeGly. There was no source*day interaction ($p > 0.10$). On day 21, piglets fed FeGly had increased Hb levels (+15.5%, $p < 0.05$); increased Ht (+12.3%, $p < 0.001$) and increased RBC (+5.1%, $p < 0.10$) compared to FeSO_4 . On day 42, Hb and Ht were increased ($p < 0.001$)

for FeGly compared to FeSO_4 . Results of this study suggest that Fe from FeGly is more bioavailable than FeSO_4 and reduces therefore the risk in anemia when supplemented to post-weaning piglets.

Key Words: Iron, Bioavailability, Piglet

TH127 Effects of sodium bisulfate on growth performance of weaning pigs. J. Jarrett^{*}, S. Carter, J. Bundy, M. Lachmann, and T. Walraven, *Oklahoma State University, Stillwater*.

Two experiments were conducted to determine growth performance of weaning pigs fed sodium bisulfate (NaHSO_4), as a potential acidifier, at varying levels of inclusion. Pigs were stratified by sex, weight and ancestry and assigned to one of four dietary treatments containing 0, 0.2, 0.4, and 0.8% inclusion of NaHSO_4 . All diets were formulated on a total lysine basis for a typical, 4 phase, nursery-feeding program (1.60, 1.50, 1.35, and 1.20%). NaHSO_4 was added at the expense of sodium chloride. Pigs and feeders were weighed weekly to determine ADG, ADFI, and G:F. In Exp. 1, 200 pigs (5 pens/trt; 10 pigs/pen) were fed a common Phase 1 diet. Pigs were then allotted to one of four treatments for Phases 2 - 4. In Phase 2, there was no difference ($P > 0.10$) in ADG or ADFI among treatments, but G:F tended to improve (linear, $P < 0.07$) with increasing NaHSO_4 . There were no differences ($P > 0.10$) in ADG, ADFI, or G:F for Phases 3 and 4. Overall in Exp. 1, there was no difference ($P > 0.10$) in ADFI; however, ADG ($P < 0.05$) and G:F ($P < 0.06$) improved quadratically as NaHSO_4 levels increased in the diet. In Exp. 2, 240 pigs (6 pens/trt; 10 pigs/pen) were allotted at weaning in the same fashion to the four dietary treatments fed in all four phases. During Phase 1, there was no effect ($P > 0.10$) of NaHSO_4 on ADG, ADFI, or G:F. In Phase 2, NaHSO_4 addition increased (linear, $P < 0.04$) ADG and tended to improve G:F (linear, $P < 0.09$). No differences ($P > 0.10$) were observed in growth performance for Phase 3. During Phase 4, NaHSO_4 increased (linear, $P < 0.02$) ADG and tended to increase G:F (linear, $P < 0.07$). Overall, in Exp. 2, there was no effect ($P > 0.10$) of NaHSO_4 on ADFI or G:F, but increasing inclusion of NaHSO_4 tended to improve ADG (linear, $P < 0.07$). When combining results from both experiments (11 pens/trt) for Phases 2 - 4, ADG tended to increase (linear, $P < 0.06$) and G:F improved (quadratic, $P < 0.03$) for pigs fed NaHSO_4 . These results suggest that feeding NaHSO_4 at 0.4 or 0.8% inclusion may improve growth performance in weaning pigs.

Key Words: Weaning Pigs, Sodium Bisulfate, Growth Performance

TH128 Effects of dietary inorganic sulfate levels on growth performance and markers of intestinal inflammation in growing pigs. T. E. Weber^{*1}, C. Spence², T. R. Whitehead², and B. J. Kerr¹, ¹*USDA-ARS, Ames, IA*, ²*USDA-ARS, Peoria, IL*.

Ethanol co-products may contain moderate amounts of inorganic sulfur. In the intestine, inorganic sulfate is reduced to hydrogen sulfide by sulfate-reducing bacteria. Hydrogen sulfide has been found to alter the inflammatory response in rodent models, but the impact of dietary sulfate on inflammation in pigs has not been reported. In a 35 d experiment, pigs ($n = 64$; 13.3 ± 1.7 kg) were fed diets containing 0, 0.625, 1.25, 2.5, or 5.0% calcium sulfate. Two control diets containing reduced levels of calcium and sulfur were also fed. On d-35, all pigs were weighed and samples of intestinal tissue and mucosa were harvested from pigs fed 0

and 5% calcium sulfate for analysis of cytokine, intracellular adhesion molecule 1 (ICAM1), and suppressor of cytokine signaling 3 (SOCS3) mRNA. The activity of mucosal alkaline phosphatase and sucrase, and the abundance of I κ B α and phosphorylated p22/p44 MAP kinase (MAPK) in intestinal tissue were also determined. Increasing dietary sulfate had no impact on ADG or ADFI, but there was a cubic effect ($P < 0.05$) for G:F as sulfate levels increased. There was no difference in growth performance found in pigs fed reduced calcium or sulfate levels when compared to pigs fed the diet containing added inorganic sulfate. Real-time RT-PCR analysis revealed that feeding 5% inorganic sulfate increased ($P < 0.05$) the relative abundance of ICAM1, tumor necrosis factor α (TNF α), and SOCS3 mRNA and tended ($P < 0.09$) to increase the relative abundance of IL-6 mRNA in ileal tissue compared to pigs fed 0% added inorganic sulfate. In pigs fed diets containing 5% inorganic sulfate there tended ($P < 0.10$) to be a decrease in IL-6 and TNF α mRNA. Pigs fed 5% inorganic sulfate had a reduced ($P < 0.05$) abundance of I κ B α and an increase ($P < 0.05$) in phosphorylated MAPK in ileal tissue, but there was no effect in colon tissue. Addition of 5% inorganic sulfate had no impact on mucosal alkaline phosphatase or sucrase activity. These data suggest that growing pigs can tolerate relatively high levels of dietary inorganic sulfate and that high sulfate levels alter intestinal inflammatory mediators.

Key Words: Pig, Sulfate, Cytokine

TH129 Differential expression of 15 selenoprotein genes in various tissues of pigs. H. Zhao¹, J. C. Zhou¹, X. Xia¹, K. N. Wang¹, J. G. Li¹, Y. Zhao¹, Y. Liu¹, and X. G. Lei^{*1,2}, ¹*Sichuan Agricultural University, Ya'an, China*, ²*Cornell University, Ithaca, NY*.

Although 25 selenoproteins have been identified in mice, there is little information on the sequences and expression of the new selenoproteins in pig tissues. Recently, we have cloned porcine *gpx2*, *sel X*, *sel N*, *sel P*, *sel I5* and *sps2*. This experiment was to determine expression profiles of these 6 genes and another 9 selenoprotein genes (*gpx1*, *gpx3*, *gpx4*, *di1*, *di3*, *sel M*, *sel W*, *sel K*, and *txnr1*) in 7 porcine tissues by quantitative real-time RT-PCR. Weanling male pigs (BW = 10.3 \pm 0.32 kg, n=4) were fed a corn-soybean meal diet containing 0.3 mg Se/kg for 8 wk, and were killed to collect liver, kidney, loin, brain, testis, pituitary, and thyroid for total RNA isolation. Relative mRNA levels of the selected genes were detected using the One-Step SYBR Green Real-Time RT-PCR

(7900HT, Applied Biosystems, Perkin Elmer, Foster City, CA), and normalized with the levels of beta-actin and glyceraldehydes 3-phosphate dehydrogenase. The inter-tissue comparisons were estimated using the Delta-delta method (Applied Biosystem). Results indicate detectable mRNA expression for all the 15 genes in all the 7 assayed tissues. Liver, kidney, and muscle had the highest expression of *gpx1*, *gpx3*, *sel P*, *sel W*, *sel X*, *sps2*, *sel K*, and *txnr1*. Pituitary showed a high expression of *gpx3*, *gpx4*, *di3*, *sel I5*, and *sel N*. In the thyroid, expression of *sel M* was the highest, followed by *sel P* and *sel N*. In the brain, expression of *sel W* ranked the highest, followed by *sel P* and *sel N*. In conclusion, the 15 selenoprotein genes were differentially expressed in a tissue- and protein-specific fashion in growing pigs.

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Key Words: Quantitative Real-time RT-PCR, Selenium, Sus Scrofa

TH130 Intestinal and renal Type II NaPi co-transporter gene expression patterns in growing pigs fed with different levels of dietary calcium. Y. Yin*, S. X. Wang, T.-J. Li, R.-L. Huang, X.-F. Kong, P. Kang, Q. Hu, Z. Liu, and W. Wang, *The Chinese Academy of Sciences, Changsha, Hunan, P.R. China*.

This study was conducted to investigate the effect of different levels of dietary calcium on the patterns of NaPi-II co-transporter mRNA expression in growing pigs. 25 barrow pigs (20.9 \pm 0.95 kg) were fed a diet containing 5 different levels of Ca (0.29, 0.44, 0.60, 0.75, and 0.91%) by using different supplementations of limestone powder. Each trial lasted for 35 days and the pigs were slaughtered on the last day. Jejunum and kidney samples were collected to measure the mRNA expression of NaPi-IIc and NaPi-IIa using real-time PCR. Compared with the calibrator Ca level of 0.60% according to the NRC (1998), pigs fed diets with Ca level of 0.44%, 0.75 % and 0.91% had higher mRNA expression of NaPi-IIc in jejunum (1.49, 13.60 and 7.65) and NaPi-IIa in kidney (2.15, 6.53 and 8.48). Pigs fed with Ca level of 0.29% had lower mRNA expression of NaPi-IIa. These results suggest that the levels of dietary calcium affect mRNA expression of NaPi-II in jejunum and kidney.

Key Words: Pigs, Sodium-Dependent Pi Absorption, Phosphorus