

**82 Effects of sodium chloride and protein source on early weaned pig performance.** T. G. Wiseman\* and D. C. Mahan. *The Ohio State University, Columbus.*

A total of 344 crossbred pigs weaned at 14 d of age, were used in 3 experiments to evaluate the effects of NaCl levels and protein sources on postweaning pig performance in swine starter diets. In Exp. 1, NaCl was added at 0, .20, .40, and .60% to diets containing either plant or animal protein sources. The basal diets analyzed .01% Na and .07% Cl when the plant protein, and .37% Na and .69% Cl when the animal protein sources were fed. The experiment was conducted as a 2 X 4 factorial in a RCB design in 3 replicates. Added NaCl to diets containing plant protein sources resulted in higher gains and gain:feed ratios during the 0 to 14 d period ( $P < .01$ ), whereas when added to diets with the animal protein sources, both daily gain and gain:feed ratios declined. In Exp. 2, supplemental NaCl levels of 0, .20, .40, .60, and .80% were added to diets formulated to 1.60% lysine (0 to 14 d) and 1.30% lysine (15 to 42 d). This experiment was conducted as a RCB design in 7 replicates. The basal diet analyzed .17% Na and .16% Cl for the 0 to 14 d, and .03% Na and .15% Cl for the 15 to 42 d period. The results demonstrated a linear ( $P < .01$ ) growth response to the dietary salt levels for the 0 to 7 d period and a quadratic ( $P < .01$ ) ADG, ADFI, and gain:feed response to the dietary salt levels for the 28 to 42 d period. In Exp. 3, the 2 diets of Exp. 2, supplemented at the 0 and .40% NaCl levels were used in this experiment. This experiment was a 2 X 5 factorial in a CRD, to evaluate the effects of NaCl on gastric changes at 7, 14, 17, 21, 28, 35, and 42 d of age. Lactic acid levels in the stomach contents were consistently lower when pigs were fed the .40% NaCl throughout the postweaning period, with no effect on stomach pH levels. These results suggest that the addition of salt to plant based protein diets improved pig performance responses, but that the addition of salt was beneficial to pigs fed the animal protein diets only during the initial week postweaning. The addition of NaCl reduced lactic acid production and probably the proliferation of *Lactobacilli spp.*

Key Words: Weaning Pig, Salt, Protein

Na .37 - Animal Protein  
Cl .69

**83 Effect of supplemental NaCl, Na, or Cl in a starter diet containing spray-dried porcine plasma (SDPP) on growth performance of weanling pigs.** J. L. G. van de Ligt\*, M. D. Lindemann, H. J. Monegue, and G. L. Cromwell, *University of Kentucky, Lexington.*

A 35-d experiment utilizing a total of 175 crossbred pigs during two periods was conducted to evaluate the effect of supplemental NaCl, Na, or Cl on growth performance of weanling pigs. Pigs were weaned at 21 d and randomly allotted to seven dietary treatments on the basis of litter, weight, and gender. Pigs were penned five per pen in a conventional nursery and fed a Phase I diet (1.5% lysine, 7% SDPP) for 3 wk followed by a Phase II diet (1.25% lysine, 2% SDPP) for the remaining 2 wk of the trial. The basal diet was calculated to provide .55% Na and .34% Cl in Phase I and .40% Na and .27% Cl in Phase II. Feed and water were available on an ad libitum basis. Diets consisted of (1) the basal with no added Na or Cl, the basal + (2) .08% Na and .12% Cl from NaCl, (3) .16% Na and .24% Cl from NaCl, (4) .12% Cl from CaCl<sub>2</sub>, (5) .24% Cl from CaCl<sub>2</sub>, (6) .08% Na from Na<sub>2</sub>PO<sub>4</sub>, or (7) .16% Na from Na<sub>2</sub>PO<sub>4</sub>. ADG and feed:gain (F:G) at the end of Week 1 were 185, 205, 216, 213, 190, 210, 220 g/d and 1.17, 1.13, 1.13, 1.15, 1.14, 1.12, 1.15, respectively, with a Na level linear trend for ADG ( $P < .10$ ). By the end of Week 3, ADG and F:G were 405, 431, 418, 433, 394, 441, 439 g/d and 1.39, 1.34, 1.36, 1.35, 1.36, 1.35, 1.39, respectively, with a Cl level quadratic effect for ADG ( $P < .01$ ) and quadratic trend for F:G ( $P < .10$ ) and a Na level quadratic effect for F:G ( $P < .05$ ). At the conclusion of Week 5, ADG and F:G were 483, 515, 503, 510, 472, 521, 508 g/d and 1.56, 1.50, 1.50, 1.49, 1.49, 1.52, 1.57, respectively, with a Cl level quadratic effect for ADG ( $P < .01$ ) and linear effect for F:G ( $P < .05$ ), a Na level quadratic trend for F:G ( $P < .10$ ), as well as a trend for a Cl source difference for ADG (NaCl vs CaCl<sub>2</sub>,  $P < .10$ ). The results suggest that moderate supplementation of Na and Cl to starter diets containing SDPP may improve performance of weanling pigs but that higher levels of supplementation of either mineral may become detrimental to performance.

Key Words: Pigs, Sodium, Chloride

55% Na  
1.34% Cl  
Basal diet

**84 Pyridoxine, but not thiamin improves weanling pig growth performance.** J. C. Woodworth\*, R. D. Goodband, J. L. Nelssen, M. D. Tokach, and R. E. Musser, *Kansas State University, Manhattan.*

Two trials were conducted to determine the effects of added pyridoxine (vitamin B<sub>6</sub>) or thiamin (vitamin B<sub>1</sub>) on growth performance of weanling pigs. In Exp. 1, 180 weanling pigs (initially 5.0 kg and 21 d of age) were used in a 35-d growth assay to determine the effects of added thiamin or pyridoxine on starter pig growth performance. Pigs were fed either a corn-soybean meal-dried whey based control diet or diets containing added thiamin (2.8 or 5.5 mg/kg) from thiamin mononitrate or pyridoxine (3.9 or 7.7 mg/kg) from pyridoxine HCl. Diets were fed in meal form in two phases (d 0 to 14 and d 14 to 35 postweaning, respectively), with identical vitamin concentrations in both phases. From d 0 to 14 post weaning, pigs fed added pyridoxine had increased then decreased (quadratic  $P < .05$ ) ADG and ADFI, with pigs fed 3.9 mg/kg of added pyridoxine having the greatest response. Growth performance was not improved by added thiamin. In Exp. 2, 216 weanling pigs (initially 6.2 kg and 21 d of age) were fed either a control diet identical to Exp. 1 or diets containing 1.1, 2.2, 3.3, 4.4, or 5.5 mg/kg added pyridoxine. From d 0 to 14 post weaning, increasing pyridoxine increased then decreased (quadratic,  $P < .05$ ) ADG and ADFI, with pigs fed 2.2 to 3.3 mg/kg of added pyridoxine having the greatest ADG and ADFI (see table below). From d 14 to 35 or 0 to 35, increasing pyridoxine had no effect ( $P > .09$ ) on pig growth performance; however, ADG and ADFI numerically increased with increasing pyridoxine. Our results suggest that adding 2.2 to 3.3 mg/kg of added pyridoxine in diets fed from d 0 to 14 post weaning improves pig performance.

Item	Added Pyridoxine, mg/kg						SEM
	0	1.1	2.2	3.3	4.4	5.5	
d 0 to 14							
ADG, g	360	361	400	402	380	384	16.7
G/F	.86	.85	.88	.92	.84	.91	.02

Total = 7.7 mg/kg  
Pyridoxine

Key Words: Weaning Pig, Pyridoxine, Thiamin

**85 Ornithine  $\alpha$ -ketoglutarate and creatine effects on growth of nursery pigs.** A. C. Guzik\*, L. L. Southern, and J. P. Ladner, *Louisiana State University Agricultural Center, Baton Rouge.*

Three experiments were conducted to determine the effect of dietary ornithine  $\alpha$ -ketoglutarate (OKG) and creatine monohydrate on growth performance and plasma metabolites of nursery pigs. In each experiment, treatments were replicated with four pens of four to six pigs each. Each experiment lasted from three to four weeks and Phase I (1.6% Lys) and Phase II (1.3 to 1.5% Lys) diets were fed for 9 to 14 days each. In Exp. 1, pigs (4.7 kg and 15 d of age) were fed diets containing 0, .10%, or .75% OKG. Daily gain during Phase I and ADFI during Phase I and overall were increased, ( $P < .10$ ) in pigs fed .75% OKG. Gain:feed was not affected ( $P > .10$ ) by diet. In Exp. 2, pigs (5.8 kg and 20 d of age) were fed diets containing 0, .10%, or .50% creatine. From d 0 to 5, the .10% creatine increased (quadratic,  $P < .05$ ) ADFI. Creatine decreased (linear,  $P = .11$ ) ADG during Phase II. Creatine decreased plasma albumin ( $P = .12$ ) and urea N (PUN,  $P < .10$ ). In Exp. 3, 850 mg of OKG or 750 mg of creatine were provided daily by oral capsule to pigs four days pre-weaning to two days post-weaning. Pigs within a litter received either no capsule or capsules containing OKG or creatine. These three groups were divided at weaning into pigs that received OKG or creatine in the nursery diet. Creatine and OKG were evaluated independent of each other and were never provided in combination, pre- or post-weaning. Pigs weighed 3.9 kg four days pre-weaning and 4.9 kg at weaning at an average age of 20 days. The OKG provided by capsule decreased ( $P < .09$ ) ADG and ADFI during Phase II. The OKG did not affect PUN or plasma NEFA or glucose concentrations. Creatine added to the nursery diet increased ( $P < .03$ ) ADFI and decreased ( $P < .10$ ) gain:feed during Phase II and overall. Creatine in the nursery diet also increased ( $P < .01$ ) PUN but did not affect plasma glucose or NEFA concentrations. Creatine and OKG have variable effects on growth performance and plasma metabolites of nursery pigs.

Key Words: Pigs, Creatine, Ornithine  $\alpha$ -ketoglutarate