146 Omitting vitamin and trace mineral premixes from diets during late finishing (86 to 110 kg) did not reduce growth performance, carcass leanness, or meat quality. I. H. Kim*, J. D. Hancock, L. L. Burnham, D. H. Kropf, R. H. Hines, K. C. Behnke, M. M. Rantanen, and I. Mavromichalis, *Kansas State University, Manhattan.*

A total of 128 finishing pigs (avg initial BW of 86 kg) was used to determine if short-term deletion of vitamin and(or) trace mineral premixes affects growth performance, carcass leanness, or meat quality. Treatments were: 1) corn-soybean meal-based control with vitamin and trace mineral premixes; 2) Diet 1 with the vitamin premix omitted; 3) Diet 1 with the trace mineral premix omitted; and 4) Diet 1 with the vitamin and trace mineral premixes omitted. The diets were corn-soybean meal-based and formulated to .7% lysine, .65% Ca, and .55% P. A minolta CR-200 spectrocolorimeter (1 cm diameter aperture) was used to measure Hunter L*a*b* values and saturation index at d 0, 3, and 5. From 86 to 110 kg, ADG and gain/feed were not influenced ($P > .22$) by dietary treatment. Dressing percentage, 10th rib fat thickness, fat free lean index, and subjective scores for marbling, color, and firmness of the longissimus muscle also were not affected by dietary treatment ($P > .11$). Objective color determinations at d 0 (before display) suggested that pigs fed diets without the vitamin and(or) mineral premixes had redder meat and more vivid or intense pink color than pigs fed the control diet ($P < .06$). Meat color for pigs fed the diet without mineral premix was lighter and a more yellow than for pigs fed the diet without vitamin premix ($P < .05$). However, the color determinations for all treatments were considered to be within normal ranges. Also, the change of meat color to d 3 and 5 was similar for all treatments. Thus, withdrawal of the vitamin and(or) mineral premixes had no effect on pork muscle color stability during display. In conclusion, cost of gain can be decreased by omitting the vitamin and(or) trace mineral premixes during the late finishing phase. Also, concerns that omitting these premixes would result in fatter carcasses with poor meat color/quality were unwarranted.

Key Words: Pigs, Vitamin, Mineral

147 Efficacy of phytase and 1α-hydroxycholecalciferol in improving availability of phosphorus and amino acids in diets fed to chicks and pigs. R. R. Biehl* and D. H. Baker, *University of Illinois, Urbana.*

Several chick and pig trials were conducted to determine the efficacy of microbial phytase and 1α-hydroxycholecalciferol (1α-OH D_3) in improving phosphorus (P) and amino acid (AA) bioavailability in phytate-containing diets. The basal diet for the P studies was a conventional corn-soybean meal (C-SBM) diet containing no inorganic P but with surfeit levels of vitamin D_3. Young chicks and young pigs were fed experimental diets for 12 and 21 d, respectively, after which tibiae (chicks) or fibulas (pigs) were removed quantitatively and assayed for total ash. Total tibia ash (mg) in the chick trials was increased ($p < .01$) 68% by KH_2PO_4 addition (.10% P), 65% by phytase supplementation (1200 units/kg), 74% by 1α-OH D_3 addition (20 μg/kg), and 108% by dietary addition of both compounds. Growth rate also was increased ($p < .01$) markedly by these additions. Total fibula ash (mg) in pigs was increased ($p < .01$) 52% from .10% P addition, 50% from 1200 units/kg phytase addition, but only 3% from the 20 μg/kg 1α-OH D_3 addition ($p > .10$). Amino acid utilization was evaluated using chicks fed corn-peanut meal (PM) diets that were deficient in lysine, methionine and threonine, or in those fed SBM-dextrose diets that were deficient in methionine, threonine, lysine and valine. Diets were designed to be deficient in one or more of the deficient AA, and these diets were compared to positive control diets that were fortified with all the deficient AA. Chicks fed C-PM diets did not respond to phytase addition (600 or 1200 units/kg), regardless of AA adequacy, but those fed SBM diets responded to phytase with improved ($p < .05$) feed efficiency, when diets were deficient in one or more AA. In conclusion, both phytase and 1α-OH D_3 are effective in improving P availability from C-SBM diets fed to chicks. In pigs, the efficacy of 1α-OH D_3 in improving P availability is significantly less than in chicks. Also, phytase may improve AA utilization when SBM is fed.

Key Words: Phytase, Phosphorus, Amino Acid, Vitamin D_3 Analogs

148 Impact of dietary calorie source on rate and efficiency of gain in pigs with a moderate or high level of antigen exposure. T. S. Stahly, D. R. Cook* and R. C. Ewan, *Iowa State University, Ames.*

Impact of dietary calorie source on rate and efficiency of gain in pigs which experienced a moderate or high level of antigen exposure (AE) was determined. Pigs in moderate and high AE groups were reared via SEW and conventional rearing schemes, respectively. Within each AE group, nine sets of 3 littermate pigs were penned individually, and within a litter, pigs were self-fed one of three dietary energy regimens from 6 to 27 kg. In each energy regimen, 85% of the ME was provided by a basal mixture of ingredients (20% corn, 44% SBM, 23% dried whey, 6% dried skim milk and 7% vit-min, by weight) and 15% was provided by either corn starch (CS), choice white grease (CWG) or corn oil (CO). ME contents of the feedstuffs were based on NRC (1988) values except for CS (4.02 Mcal/kg). CS, CWG and CO diets had calculated unsaturated to saturated fatty acid ratios of 3.3, 1.5 and 5.8, respectively. Serum alpha-1 acid glycoprotein concentrations were similar at 6 kg in the moderate vs high AE pigs (710 vs 714 μg/ml) but were lower ($P<.05$) at 27 kg in moderate AE pigs (452 vs 521 μg/ml). Moderate AE pigs consumed more ME (2.79 vs. 2.27 Mcal/d, $P <.01$) and grew faster (527 vs 434 g/d, $P< .01$). Gain:ME ratios were similar between AE groups (190 vs 192 g/Mcal, $P=.71$). Replacement of CS calories with either CWG or CO calories resulted in greater ($P<.01$) growth rates in both the moderate (514 vs 529 and 536 g/d) and high (413 vs 435 and 454 g/d) AE pigs. Similarly, dietary fat calories resulted in improved ($P<.01$) gain:ME ratios in both the moderate (179 vs 192 and 199 g/Mcal) and high (180 vs 190 and 206 g/Mcal) AE pigs. Responses to the two fat calorie sources were similar. No energy regimen by AE interactions were detected. Based on these data, fat calories support a greater rate and efficiency of growth than starch calories in both moderate and high AE pigs.

Key Words: Pigs, Energy Source, Antigen Exposure

149 Effects of substituting deproteinized whey and(or) pure lactose for dried whey on weanling pig performance. W. B. Nessmith Jr.*, J. L. Nelssen, R. D. Goodband, M. D. Tokach, J. R. Bergstrom, J.A. Loughmiller, R.E. Musser, and J. W. Smith, II, *Kansas State University, Manhattan.*

Two trials were conducted to determine the effects of replacing the lactose provided by edible grade, spray-dried whey with deproteinized whey and(or) pure lactose on pig performance. In Exp. 1, 180 weanling pigs (initially 4.1 kg and 22 d of age) were allotted to treatments containing: 1) 25% dried whey, 2) 12.5% dried whey and 9% pure lactose, 3) 18% pure lactose, 4) 12.5% dried whey and 10.9% deproteinized whey, and 5) 21.7% deproteinized whey (see table below). Casein was used to replace the lysine provided by dried whey in diets containing pure lactose and deproteinized whey. From d 0 to 14 postweaning, no differences were observed in ADG or ADFI. However, pigs fed diets containing 18% lactose or 21% deproteinized whey had improved G/F ($P < .05$) compared to pigs fed diets containing 25% dried whey or 12.5% dried whey and 9% lactose. Pigs fed diets containing 21% deproteinized whey had improved G/F compared to pigs fed diets containing 12.5% dried whey and 10.9% deproteinized whey. In Exp. 2, 344 pigs (initially 4.4 kg and 14 d) were fed one of six dietary treatments based on different sources of pure lactose replacing the lactose provided by dried whey in the positive control diet (20% dried whey). In addition, a negative control diet was formulated to contain 7.2% pure lactose. Casein replaced the lysine contributed by dried whey. From d 0 to 14 postweaning, there were no differences ($P > .10$) observed in ADG, ADFI or G/F. However, pigs fed lactose source 4 had 14% poorer ADG than pigs fed lactose source 3. Day 0 to 14 ADG and G/F are shown in the table below. Further research is necessary to determine quality standards for lactose sources. In conclusion, deproteinized whey and pure lactose are effective replacements for the lactose in dried whey.

Exp. 1	Treatments				
	1	2	3	4	5
ADG, g	346	310	339	317	354
G/F	.90	.92	1.0	.97	1.05

Exp. 2		Lactose source				
	Pos. Control	1	2	3	4	Neg. Control
ADG, g	216	205	209	220	192	197
G/F	.77	.78	.81	.86	.78	.81

Key Words: Lactose, Pigs, Whey