132 Determination of endogenous intestinal losses of Ca and digestibility of Ca in canola meal fed to growing pigs. J. C. Gonzalez-Vega*[1], C. L. Walk[2], and H. H. Stein[1], *[1]University of Illinois, Urbana, [2]AB Vista, Marlborough, UK.*

An experiment was conducted to test the hypothesis that endogenous Ca is lost from the gastrointestinal tract of growing pigs. The objective was to determine the apparent total tract digestibility (ATTD) and the true total tract digestibility (TTTD) of Ca in canola meal without and with added microbial phytase. Retention of Ca from canola meal was also determined. Forty 8 growing barrows (average initial BW: 16.72 ± 2.52 kg) were allotted to a randomized design with 8 dietary treatments and 6 pigs per treatment. Diets were based on sucrose, cornstarch, potato protein isolate, corn gluten meal, and canola meal. Diets were formulated to contain 0.08, 0.16, 0.24, or 0.32% Ca from canola meal, respectively. All diets were formulated with 0 or 1,500 units per kilogram of microbial phytase (Quantum, AB Vista, Marlborough, UK) and contained 0.32% digestible P. Feces and urine samples were collected from d 6 to d 11. Results indicate that feed intake, Ca intake, P intake, and P excretion increased ($P < 0.05$) by increasing the level of Ca in the diets. The ATTD of Ca and Ca retention increased ($P < 0.05$) if dietary Ca increased and also if phytase was added to the diets. The TTTD of Ca increased ($P < 0.01$) if phytase was used, but was not affected by the level of Ca in the diets. Total endogenous losses of Ca were determined using the regression procedure. Regression analyses indicated that apparent total tract digested Ca increased (linear, $P < 0.05$) as dietary Ca intake increased. The estimated total endogenous loss of Ca was 0.160 and 0.189 mg/kg DMI for canola meal without and with microbial phytase, respectively, and these values were not different. In conclusion, endogenous Ca is lost from the gastrointestinal tract of growing pigs, and values for TTTD of Ca are, therefore, different from values for ATTD of Ca. Values for ATTD of Ca are influenced by the level of dietary Ca, but that is not the case for values for TTTD of Ca. Microbial phytase increases the digestibility of Ca in canola meal, but does not influence the endogenous loses of Ca.

Key Words: calcium, endogenous losses, pigs

133 The effect of supplemental vitamin D_3 as an oral dose or in early nursery pig diets on pig growth performance and serum 25(OH)D_3 concentrations. J. R. Flohr*[1], M. D. Tokach[1], S. S. Dritz[1], S. C. Henry[2], M. L. Potter[2], N. S. Shelton[1], L. L. Greiner[3], J. Connor[3], R. D. Goodband[1], J. L. Nelssen[1], and J. M. DeRouchey[1], *[1]Kansas State University, Manhattan, [2]Abilene Animal Hospital, Abilene, KS, [3]Innovative Swine Solutions, Carthage, IL.*

A total of 400 barrows from 80 litters (PIC 1050, initially 7 d of age) were used in a 38 d study in a 2 × 2 factorial to determine the effects of vitamin D_3 supplementation from either a single oral dose or from high levels of vitamin D_3 in early nursery diets on pig performance and serum 25(OH)D_3. On d 7 after birth, matched pairs of pigs within litters were randomly allotted to 1 of 2 oral dosages (none or 40,000 IU vitamin D_3) in a RCBD. Pigs were weighed at d 7 and weaning (d 21). Following weaning, a subset of 300 barrows were used from d 21 to 45 to determine the effects of the previously administered oral vitamin D_3 and 2 levels of dietary vitamin D_3 (1,378 or 13,780 IU/kg; 0.80% Ca and 0.63% available P) from weaning to d 31 on pig growth and serum 25(OH)D_3. A common diet containing 1,378 IU/kg of vitamin D_3 (0.70% Ca and 0.47% available P) was fed from 31 to 45 d of age. Barrows were allotted to pens based on their respective vitamin D_3 dose with pens randomly allotted to dietary treatments. There were no dose × diet interactions ($P > 0.09$). Serum 25(OH)D_3 was increased ($P < 0.01$) on d 21 and tended to be increased on d 31 by dosing pigs with vitamin D_3 before weaning. On d 31, serum concentrations increased with increasing dietary vitamin D_3 levels ($P < 0.01$). Weaning weight was not influenced ($P > 0.17$; dosed 5.26 kg vs. undosed 5.18 kg) by the oral dose of vitamin D_3. Supplementing vitamin D_3 by either dose or diet did not influence ($P > 0.23$) nursery performance. In conclusion, supplementing vitamin D_3 either orally or in the nursery diet increased serum 25(OH)D_3, but did not influence nursery pig growth performance.

Table 1.

Dosage:	No vitamin D_3		40,000 IU D_3			*P*-value		
Phase 1 Diet:	1,378 IU	13,780 IU	1,378 IU	13,780 IU	SEM	Dose × diet Interaction	Dosage Effect	Diet Effect
Item								
25(OH)D_3, ng/mL								
weaning	7.8	7.9	26.8	21.6	2.6	0.30	<0.01	0.32
d 31	21.3	33.5	28.6	35.6	2.6	0.33	0.08	<0.01
d 45	10.1	14.3	15.6	13.7	2.6	0.25	0.35	0.66
Nursery performance								
ADG, g	311	306	305	308	8	0.59	0.83	0.92
ADFI, g	386	378	380	388	9	0.28	0.83	0.99
G:F	0.80	0.81	0.80	0.79	0.01	0.65	0.57	0.84

Key Words: nursery pig, vitamin D, 25(OH)D_3

134 Carbohydrase and phytase complex improves performance and bone mineralization of pigs fed wheat-soybean base diet. P. Cozannet[1], R. Gerritsen[2], R. Maillard[1], E. Devillard*[1], and A. Preynat[1], *[1]Adisseo France SAS, CERN, Malicorne, France, [2]Schothorst Feed Research, Lelystad, Netherlands.*

The trial was carried out to investigate the effects of a multi-enzyme (enz) complex containing carbohydrases (from *Penicillium funiculosum*) and 6-phytase (from *Schizosaccharomyces pombe*) on performance and bone mineralization of growing-finishing pigs fed a wheat-soybean meal diet. Gilts [360; Talent × (GYz × Finnish Landrace)]; 7 wk; 25 kg BW) were assigned to 1 of 3 treatments according a randomized block design with 12 replicates (10 gilts/pen) for 100 d. The positive control (PC) diet was a standard diet, formulated to meet the requirement of all nutrients during growing and finishing period (NE = 8.92/8.95 MJ/kg and lys dig = 0.98/0.56 g/MJ NE, respectively), while the negative control (NC) diet was formulated with reductions in energy (0.42 MJ NE/kg), available phosphorus (av P; 0.10%) and calcium (Ca; 0.08%). NC diet was supplemented or not with Rovabio Max (1,100 endo-β-1,4-xylanase visco units, 100 endo-1,3(4)-β-glucanase units and 500 Phytase units /kg of feed; 50 g/ton of feed). Animal feed intake and BW were recorded at the end of each period. Front left meta-carpi of one pig per pen were collected for bone ash percentage (BAP) measurement at the end of the experiment. Results were analyzed in Genstat (ANOVA) and means compared using LSD test. During the 5 weeks growing period, no treatment effect was observed. During finishing period, ADFI was not affected by treatments ($P = 0.29$).Gilts had higher ADG (887 vs. 818