(P=0.016), d 0 to 91(P=0.002), and d 56 to 91(P=0.006). Pigs fed diets containing NAR had a higher G:F than those fed diets containing VIR during d 0 to 77 (P=0.037) and d 0 to 91(P=0.042). Pigs fed NAR had a higher (P=0.027) ADFI than those fed diets containing VIR during periods d 0 to 28 and lower (P=0.035) ADFI than pigs fed VIR during d 56 to 77. Pigs fed diets containing VIR had less fat depth (P=0.034) than those fed CON. HCW and backfat depth were not different (P>0.1) across diet treatments. Overall, pigs fed diets containing NAR had a higher G:F than those fed VIR or CON diets.

Item	CON	VIR	NAR	SE	VIR vs CON, P<	NAR vs CON, P<	NAR vs VIR, P<
ADG, 0 to 91	0.980	0.976	0.985	0.088	0.650	0.554	0.297
G:F, 0 to 91	0.391	0.393	0.399	0.004	0.302	0.002	0.042
ADFI, 0 to 91	2.505	2.476	2.464	0.025	0.250	0.103	0.628

Key Words: narasin, pig, virginiamycin

O026 **Increasing dietary levels of extruded and expeller-pressed canola juncea meal on pig growth performance and carcass traits.** X. Zhou [1,*], M. Young [2], V. Zamora [2], R. T. Zijlstra[1], E. Beltranena [3], [1]*Department of Agricultural, Food & Nutritional Science, University of Alberta, Edmonton,* [2]*Gowans Feed Consulting Ltd, Wainwright,* [3]*Alberta Agriculture and Rural Development, Edmonton, Canada.*

The dietary energy value of conventional dark-seeded canola meal (*Brassica napus*) is considered low because of its relatively high fiber and low oil content. *B. juncea* is a novel yellow-seeded canola species with thinner seed coat and therefore lower fiber content. If seeds are expeller-pressed rather than solvent-extracted, residual oil remains in the meal (12 – 17%) and higher dietary energy value can be expected. Extrusion prior to expeller-pressing could reduce effects of glucosinolates by inactivating the seed enzyme myrosinase and increase both fat and AA digestibility. To evaluate effects of feeding increasing (0, 5, 10, 15, 20%) inclusions of extruded + pressed (EP) *B. juncea* meal on pig growth performance and carcass traits, 1,056 pigs (27 kg) housed in 48 pens by sex were fed 5 dietary regimens with 0, 5, 10, 15, 20% *B. juncea* meal over 5 growth phases. Diets were formulated to equal g SID Lys:Mcal NE by phase (4.10, d 0-21; 3.70, d 22-42; 3.30, d 43-63; 3.00, d 64-74; 2.75, d 77- 120 kg market weight). For the entire trial, each 5% increase in dietary EP *B. juncea* meal inclusion linearly reduced (P<0.01) ADFI by 54 g and ADG by 14g, but did not affect (P>0.10) G:F. Each 5% increase in dietary EP *B. juncea* meal inclusion linearly reduced (P<0.01) carcass weight by 52 g and loin depth by 0.65 mm, but did not affect (P>0.10) backfat thickness, pork yield, or index. Pigs fed 20% EP *B. juncea* meal reached slaughter weight 2.5 d later and were 4 kg lighter (P<0.01) than controls not fed canola meal. In conclusion, increasing dietary inclusions of EP *B. juncea* meal up to 20% linearly reduced growth performance and carcass traits. The reduction in performance could be attributed to high 3-butenyl (10 µmol/g) content in EP *B. juncea* meal, a bitter glucosinolate than others found in dark-seeded *B. napus* canola meal.

Key Words: *B. juncea* canola meal, carcass, extrusion and expeller-pressing, performance, pig

NONRUMINANT NUTRITION: SOW NUTRITION AND MANAGEMENT

O131 **Variability in daily urinary nitrogen excretion in gestating gilts at 2 levels of energy intake**. E. G. Miller*, D. Wey, C. de Lange, C. Levesque, *Animal and Poultry Science, University of Guelph, Canada.*

In nitrogen (N) balance studies, urine samples are pooled across days to estimate mean daily urinary nitrogen excretion (UN), without considering daily variation in UN. In a gestating gilt N balance study, daily UN was quantified to determine the coefficient of variation (CV) within and across N-balance periods. Nine gilts were placed on high or low daily energy intake (8.9 and 6.4 Mcal DE/d) from the same diet (containing 3.5Mcal DE/kg and 2.8g N/kg of feed) during gestation. In each gilt, total daily urine was collected using urinary catheters during 4.5 d periods starting at 35, 49, 63, 85, and 106 d of gestation, whereby the last 0.5 collection day (minimum duration 5.5h) was adjusted to a 24h period based on duration of collection. Due to technical difficulties, 10% of daily UN collections were incomplete and UN was again adjusted to a 24 h period (UN_{adj}). Within pig and across stage of gestation, the CV for UN_{adj} ranged from 2 to 49% and when daily collections of <20h were removed the CV was not improved (1 to 57%). The UN_{adj} CV ranged from 3 to 29% and 2 to 42% for the high and low energy intakes, respectively. When based on at least 3 daily UN_{adj} values within pig and stage of gestation, a CV of < 15% could be obtained in 88% of the collection periods. There was an effect of diet (P<0.001) and stage of gestation (P<0.04), but no diet x stage of gestation interaction. The UN_{adj} was greater (P<0.001) for high than low dietary energy intake (31 and 23g/d, respectively) but UN_{adj} as a percent of N intake was lower (P<0.01) for high than low dietary energy intake (41 and 46%, respectively). The UN_{adj} was 26, 27, 29, 28, and 23 g/d (SEM=2.0) at 35, 49, 63, 85, and 106 d, respectively. The UN_{adj} was lowest (P<0.05) at 106 d of gestation. The data indicates that urine collections between 5.5 and 24h may be used to calculate daily UN, but should be adjusted to 24h. Despite the large variation within pig and N-balance periods, differences between dietary treatments and collection periods were identified. Daily variation in UN excretion within collection periods should be considered when conducting N-balance studies in gestating gilts.

Key Words: gestating gilts , urinary nitrogen, variation

O132 **The effects of added vitamin D3 in maternal diets on sow and pig performance.** J. Flohr[1,*], M. D. Tokach[1], J. L. Nelssen[1], S. S. Dritz[1], J. M. DeRouchey[1], R. D. Goodband[1], J. R. Bergstrom[2], [1]*Kansas State University, Manhattan,* [2]*DSM Nutritional Products Inc., Parsippany.*

A total of 84 sows (PIC 1050) were used to determine the effects of feeding increasing dietary vitamin D_3 on maternal performance, sow and piglet serum 25(OH)D_3 and Ca, suckling pig performance, and neonatal bone mineralization. Sows (n=28/treatment) were allotted at breeding to 1 of 3 dietary treatments (1,500, 3,000, or 6,000 IU/kg vitamin D_3; 0.88% Ca and 0.50% available P in gestation, and 0.88% Ca and 0.48% available P in lactation) in a RCBD with parity as a blocking factor. Serum 25(OH)D_3 was collected from sows on d 0 and 100 of gestation, at farrowing, and at weaning (d 21). Pigs were weighed at birth and weaning to determine weight gain, and a subsample of the population were bled at birth, on d 10, and at weaning to determine serum 25(OH)D_3 and Ca. Fifty-

O132 Table

Maternal Vit. D_3, IU/kg	Sow 25(OH)D_3, ng/mL		Sow Ca, mg/dL		Pig 25(OH)D_3,ng/mL		Pig Ca, mg/dL		Pig BW, kg		bone	ash, %
	F[1]	W	F	W	F	W	F	W	F	W	rib	femur
1,500	30.1	39.3	8.9	9.3	4.5	5.6	10.3	10.1	1.31	5.32	43.6	44.9
3,000	35.4	52.5	9.3	9.5	5.9	8.0	10.7	10.0	1.36	5.56	43.6	44.5
6,000	56.9	66.3	9.3	9.4	9.4	14.0	10.3	9.8	1.35	5.54	43.5	44.8
SEM	4.65	4.65	0.34	0.34	0.75	0.81	0.62	0.66	0.042	0.165	0.80	0.55

[1]F=farrowing, W=weaning

four pigs were euthanized at birth (18/treatment) to collect femurs and ribs for bone ash determination. Overall, increasing maternal vitamin D_3 increased (linear, $P < 0.01$) sow serum 25(OH)D_3 on d 100 of gestation, farrowing, and weaning. Additionally, suckling pig serum 25(OH)D_3 was increased (quadratic, $P < 0.03$) at birth, d 10, and weaning with increased maternal vitamin D_3. However, no differences were observed in maternal performance criteria ($P > 0.32$), pig birth or weaning weights ($P > 0.43$). Bone ash content of femurs and ribs were not different ($P > 0.66$) and serum Ca for sows or pigs was not influenced ($P > 0.14$) by maternal vitamin D_3 treatment. In conclusion, increasing dietary vitamin D_3 in sows increased serum 25(OH)D_3, and suckling pig serum 25(OH)D_3, but increasing vitamin D_3 in maternal diets did not influence serum Ca, performance parameters for sows, or growth and bone mineralization of their offspring. (See table above.)

Key Words: 25(OH)D_3, sow performance, vitamin D

O133 **Development of a prediction equation to estimate post-partum sow body weight from pre-partum weight.** D. Rosero [1,*], C. Arellano [2], E. van Heugten [1], M. E. Johnston [3], R. D. Boyd [4], [1]*Department of Animal Sciences,* [2]*Department of Statistics, North Carolina State University, Raleigh,* [3]*JBS United , Sheridan, IN,* [4]*Hanor Company, Inc., Franklin, KY.*

The objective of this study was to derive a prediction equation to estimate the sow BW after farrowing from pre-farrow BW and total litter size at birth. Data were collected from 748 first through sixth litter PIC sows from a commercial research farm. Sows were weighed individually at placement (112 to 114 d of gestation) and again after farrowing. Pre-farrow BW was adjusted to estimate immediate pre-farrow weight assuming 0.7 kg daily gain from placement to day of farrowing based on a daily ME intake of 8 Mcal (Close et al., 1984). Post-partum sow weight was determined within 20 h of farrow. Information collected included total alive and stillborn pigs, but not placenta weight. A total of 10 sows were removed from the analysis because BW change (post-farrow minus pre-farrow BW) was greater than 3 standard deviations. Body weight of the remaining 738 sows ranged from 147.3 to 361.3 kg and averaged 247.8±37.8 kg. Total pigs born (alive plus stillborn) averaged 10.9±2.3 pigs and ranged from 2 to 18 pigs born. Post-farrow sow BW prediction equation is described by: BW (kg) = -19.75 + 0.973 x pre-farrow BW – 1.09 x pigs born (R^2=0.962, P<0.001; relative error of predicted values ranged from -7.55 to 7.22%). Post-farrow BW was alternatively estimated using equations suggested by Noblet et al., 1985 for comparison. Estimated weight of fetus (logeW = 8.729 - 4.077 x exp (-0.033 x (t - 45))+ 0.0002 f t + 0.068 n), placenta (logeW = 7.027 – 0.952 exp (-0.069 (t – 45)) + 0.0001 f t + 0.093 n) and fluids (loge W = -0.264 + 0.188 t – 0.001 t2 + 0.132 n; where W is weight (g), t is the stage of gestation (d), n is total pigs born and f is the level of energy intake (MJ ME/d)) were subtracted from pre-farrow BW to estimate weight after farrowing. The Pearson correlation coefficient between the measured post-farrow weights and estimated weights using Noblet equations was 0.978, P<0.0001; which indicates a strong linear relationship between these two variables. In conclusion, use of the proposed equation or Noblet equations resulted in similar and accurate estimated weights for sows post-farrow when compared to actual weight**.**

Key Words: body weight, farrowing, prediction equations

O134 **Effects of commercial diets with or without CALSPORIN® (*Bacillus subtilis* C-3102 spores) on fresh fecal microbial profiles of sows from breeding through lactation.** B. K. Knudson[1,*], N. Otomo[2], T. Hamaoka[2], B. Lee[2], S. C. Johnson[3], [1]*Nutrition Services – Livestock Management Company (LiManCo), Waverly, IA,* [2]*Calpis USA, Inc., Mt. Prospect, IL,* [3]*Quality Technology International (QTI), Inc., Elgin, IL.*

Three groups each having 10 sows, initially at different stages of reproduction (breeding, early gestation, or advanced gestation), were used in an 18-week feeding trial at a commercial facility in Iowa from May-September to evaluate the effects of CALSPORIN® (0 or 3x10^5 cfu/g feed) on fresh fecal microbial profiles. The initial 30 sows were reduced to 19 from movement within the facility, recycling, and death loss. This sow herd had previously been on a regimen of high (~240 g/ton, top dressed) BMD® in feed for 2 weeks prior to farrowing for control of clostridial enteritis caused by *C. perfringens* in suckling piglets (history of clostridial scours on the premises). Fresh fecal sampling was done on 6 dates, at initiation of the trial and prior to feeding CALSPORIN® (breeding stage or during gestation) or during CALSPORIN® feeding (pre-farrowing, farrowing, and lactation), in the 3 groups of sows. Samples were submitted to Calpis USA, Inc. Laboratory in Mt. Prospect, IL for immediate microbial profiling on culture media. By combining data for like stages of production (breeding or gestation pre-trial with 10 sows/group; or pre-farrowing, farrowing, or lactation during CALSPORIN® feeding with 7, 6, and 6 sows/group) from the 3 groups of sows, selected species of fecal bacteria were evaluated (1-Way ANOVA, 4 treatments, Statistix® 9).

Table 1. Sow fresh fecal bacteria counts, log10 cfu/g (in positive cultures), by stage

	Pre-trial feeding	During CALSPORIN®	P value
Enterobacteriaceae	7.47 (19/19)	7.15-7.62 (19/19)	0.170
Salmonella	4.91 (12/19)	4.82-5.32 (12-14/19)	0.349
Lactobacilli	7.55 (15/19)	7.58-7.82 (15-18/19)	0.643
Bifidobacteria	5.59 (8/19)	5.59-6.14 (11-14/19)	0.339
Total anaerobic count	8.55 (19/19)	8.38-8.61 (19/19)	0.376
Lactobacilli/Anaerobes	16.0 (15/19)	20.0-28.9 (15-18/19)	0.336
Total aerobic count	4.46 (19/19)	5.38-5.86 (19/19)	<0.001
Clostridium perfringens	5.79 (18/19)	4.47-5.36 (7-18/19)	<0.001
Bacillus subtilis C-3102	2.83 (17/19)	5.36-5.84 (19/19)	<0.001