276 Impact of pre-farrow feeding amount and timing on stillborn rate of sows. Kayla Miller[1], Trey A. Kellner[2], [1]*Iowa State University,* [2]*AMVC Nutritional Services*

Pre-farrowing feeding allowance and timing are often based on logistical ease instead of optimizing farrowing performance. The objective of this experiment was to decrease the stillborn rate via the amount and timing of feeding prior to farrowing. A total of 245 PIC 1050 (PIC, Inc., Hendersonville, TN) individually housed bred females were randomly allotted to 1 of 3 treatments on d 0. The 3 pre-farrow feeding treatments consisted of: 1) 2 meals of 0.9 kg fed at 630 h and 1530 h; 2) 1 meal of 1.8 kg fed at 630 h; and 3) 2 meals of 2.7 kg fed at 630 h and 1530 h. Dietary treatment commenced on entry into the farrowing crate and continued until they farrowed (ranged from d 2 to d 10). Data were analyzed using Proc MIXED (SAS 9.4; Cary, NC) with treatment as the main effect and sow as the experimental unit. Females having a litter with a total born ≤ 11 or ≥ 21 or did not consume their allotted feed were considered outliers and were removed from the statistical analysis. Feeding 2 meals of 0.9 kg per day trended to reduce stillborn rate compared to the other 2 pre-farrow feeding treatments (2 meals of 0.9 kg = 5.6%, 1 meal of 1.8 kg = 8.6%, 2 meals of 2.7 kg = 9.0%; P = 0.090). Pre-farrow feeding amount and time had no impact on total born or mummies (P ≥ 0.270). As a bonus, feeding small meals multiple times a day will reduce the farm's overall feed cost compared to providing full feed access pre-farrow. In conclusion, implementation of a pre-farrowing feeding strategy is a vehicle that can be used to reduce the stillborn rate in commercial production.

Keywords: pre-farrow feeding, sows, stillborn rate,

277 Effects of timing and amount of feed prior to farrowing on sow and litter performance under commercial conditions. Kiah M. Gourley[1], Analicia J. Swanson[1], Rafe Royall[2], Jason C. Woodworth[3], Joel M. DeRouchey[1], Mike D. Tokach[1], Steve S. Dritz[1], Kayla J. Milnes[4], Chad W. Hastad[4], [1]*Kansas State University,* [2]*Texas Tech University,* [3]*Department of Animal Sciences & Industry, College of Agriculture, Manhattan, KS 66506,* [4]*New Fashion Pork*

A total of 727 mixed parity (mean=3.8) sows were used to evaluate the effects of timing and amount of meals before farrowing on sow and litter performance. Upon entry to the farrowing house (d 113), sows were blocked by weight within parity and allotted to one of three feeding management treatments until farrowing: 1) 2.7 kg lactation diet (1.15% SID lysine and 2,153 Kcal/kg NE) once daily at 0700 h; 2) 4 daily meals of 0.67 kg (0100 h, 0700 h, 1300 h, 1900 h); 3) ad libitum lactation diet and encouraged to consume feed at 0100 h, 0700 h, 1300 h, and 1900 h. Data was analyzed using the lme function (lmer package of R, version 3.5.2). Feeding sows ad libitum before farrowing tended to reduce sow body weight loss (P=0.077) and reduce backfat loss (P=0.003) from entry to weaning compared to sows fed 4 daily meals, with sows fed once daily intermediate. Litter gain from 24 h to weaning tended to be greater (P=0.073) in sows fed ad libitum or 4 times daily prior to farrowing compared to sows fed one meal. Piglet weaning weight increased (P=0.050) in sows fed ad libitum before farrowing, compared to those fed one meal, with those fed 4 times daily intermediate. There was no evidence for difference in farrowing duration, stillborn rate, colostrum yield, or 24 h piglet survival regardless of treatment. However from 24 h to weaning, sows fed one daily meal had higher (P=0.012) percentage of fall-behind pigs compared to sows fed ad libitum, and increased (P=0.027) preweaning mortality compared to sows fed four daily meals, resulting in reduced (P=0.006) weaned percentage compared to sows fed four daily meals. There was no evidence for a negative impact when sows were fed ad libitum from 2 to 3 days before farrowing.

Table 1. Timing and amount of feed prior to farrowing on sow and litter performance

Response	2.7 kg × 1 delivery	0.67 kg × 4 deliveries	Ad libitum × 4 deliveries	SEM	*P*-value
Count, n	242	245	240	--	--
Sow weight change[2]	-23.8	-25.4	-22.1	<1.10[1]	0.077
Sow backfat change[2]	-2.2[ab]	-2.7[a]	-1.9[b]	0.16	0.003
Sow feed intake					
Total pre-farrow[3], kg	7.5[b]	7.9[b]	9.7[a]	<0.31[1]	0.001
Lactation ADFI[4], kg	4.8	5.0	5.1	0.090	0.175
Total feed intake[5], kg	116.0[b]	117.8[ab]	123.8[a]	<3.50[1]	0.018
Farrowing duration, min	209	200	214	1.2	0.226
Piglet body weight, kg					
Birth	1.24	1.28	1.25	<0.013[1]	0.055
Weaning	4.80[b]	4.90[ab]	4.94[a]	0.045	0.050
Litter gain 24 h to wean, kg	34.1	35.9	35.3	<0.62[1]	0.064
Litter characteristics					
Total Born, n	16.1	15.7	16.0	0.23	0.351
Born alive, %	93.4	93.8	93.6	0.45	0.664
Stillborn, %	6.6	6.1	6.4	0.44	0.667
Fall-behind, %	7.5[a]	6.3[ab]	5.9[b]	0.52	0.012
Dead, %	7.6[a]	6.1[b]	6.6[ab]	0.49	0.027
Weaned, %	74.3[b]	77.6[a]	76.1[ab]	0.80	0.006

[1]Heterogeneous variance by treatment used to fit the model, highest SEM is reported.
[2]Change from entry to the farrowing house to weaning.
[3]Sum of feed consumed from loading to farrowing, measured on all sows.
[4]Lactation average daily feed intake, measured on a subsample of 310 sows.
[5]Total feed consumed from loading until weaning, measured on a subsample of 310 sows.

Keywords: lactation sow, farrowing duration, meal frequency

269 Effects of high phytase supplementation in lactation diets on sow and litter performance.

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A total of 109 sows (Line 241; DNA, Columbus, NE) were used in a study to evaluate the effect of increasing phytase concentration in lactation diets on sow and litter performance. On d 107 of gestation, sows were blocked by body weight and parity and allotted to 1 of 3 dietary treatments of increasing phytase concentration (0, 1,000, or 3,000 FYT/kg; Ronozyme HiPhos 2700; DSM Nutritional Products, Inc., Parsippany, NJ). The control diet contained no phytase and was formulated to contain 0.50% standardized total tract digestible phosphorus (STTD P; 0.45% available P) and 0.62% STTD calcium (0.90% total Ca). The same STTD P and Ca concentrations were formulated for the phytase diets considering a release of 0.132 STTD P and 0.094 STTD Ca in both diets. Diets were fed from d 107 of gestation until weaning (d 18 ± 2). Litters were cross-fostered within treatment until 48 h post-farrowing to equalize litter size. Linear and quadratic response to phytase concentration was evaluated using the lmer function in R. There was no evidence for difference in sow body weight change, farrowing performance, wean-to-estrus interval, or litter size among dietary treatments. Sow average daily feed intake from farrowing to weaning tended to increase (linear, P=0.093) as phytase increased. Although not significant (linear, P =0.226), farrowing duration decreased as phytase increased. Litter weaning weight increased (quadratic, P=0.039) and overall litter gain increased (quadratic, P=0.047) with 1,000 FYT of phytase. In summary, sow feed intake tended to increase linearly with increasing phytase; however, feeding 1,000 FYT/kg maximized overall litter gain and weaning weight. This small-scale study suggests sow and litter performance benefits due to high inclusions of dietary phytase; however, a commercial trial with more sows is warranted to confirm these results.