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.

Table 1. Effect of high phytase supplementation in lactation diets on sow and litter performance[1]

	Phytase, FYT/kg[2]				Probability, *P* =	
	0	1,000	3,000	SEM	Linear	Quadratic
Sows, n	36	36	37	--	--	--
Sow body weight change, kg (farrow to wean)	-10.5	-10.6	-10.6	1.64	0.943	0.943
Sow ADFI[3], kg						
d 107 to farrow[4]	2.2	2.4	2.3	0.06	0.112	0.009
d 0 to 7	4.3	4.7	4.6	0.13	0.140	0.144
d 7 to 14	6.2	6.4	6.5	0.18	0.367	0.793
d 14 to wean	6.8	7.2	7.4	0.20	0.020	0.264
Farrow to wean	5.6	5.9	6.0	0.13	0.093	0.285
Farrowing duration, min	399	376	350	1.08	0.226	0.873
Pigs weaned/sow, n	12.9	13.7	13.1	1.05	0.961	0.337
Piglet survivability[5], %	96.0	97.0	97.0	1.28	0.387	0.714
Overall litter gain, kg	46.3	50.3	48.2	1.55	0.543	0.047

[1]A total of 109 sows and their litters were used in a 21 d study.
[2]Ronozyme HiPhos 2700; DSM Nutritional Products, Inc., Parsippany, NJ
[3]ADFI = average daily feed intake.
[4]Sows were loaded into the farrowing room at d 107 of gestation.
[5]Piglet survivability = litter count at weaning/litter count on d 2.

Keywords: farrowing duration, phytase, sow

272 Hybrid rye may replace up to 75% of the corn in diets for gestating and lactating sows without negatively impacting sow and piglet performance.

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An experiment was conducted to test the hypothesis that hybrid rye can replace corn in gestation and lactation diets without negatively affecting sow and litter performance. For gestation and lactation, a corn-soybean meal control diet and 3 additional diets in which hybrid rye replaced 25, 50, or 75% of corn were formulated. Sows were randomly allotted by parity to treatments, with 45 replicate sows per treatment. Sows were individually housed for the duration of the experiment. Sow BW were recorded on d 7 and d 105 of gestation, as well as within 24 h after farrowing and on the day of weaning (approximately d 20 of lactation). Number and weights of live born, still born, and mummified piglets were determined within 24 h of farrowing. Data related to piglet mortality were analyzed using SAS Proc Glimmix with binomial distribution, whereas all other data were analyzed using Proc Mixed. The statistical models included the fixed effects of diet and parity. Diet did not influence sow BW or sow ADG at any point in the experiment (Table 1). Diet did not affect number or weights of total, live, or still born pigs, but there was an increase and then a reduction in the number of pigs weaned, litter wean weight, and litter ADG as the inclusion of hybrid rye in the diets increased (quadratic, $P < 0.05$). Piglet mortality, as well as the proportion of piglets crushed by sows, tended ($P < 0.10$) to be quadratically reduced as hybrid rye was added to the diet. In conclusion, replacing corn with hybrid rye in gestation and lactation diets had no effect on sow BW changes nor on number or birthweights of piglets, and overall, diets with 25% and 50% corn replacement rate with rye resulted in improved sow lactation performance.