EFFECT OF RIBOFLAVIN SUPPLEMENTATION ON REPRODUCTIVE PERFORMANCE OF BRED SOWS

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Story in Brief

Riboflavin supplementations during a specific time interval following breeding has been reported to increase litter size. A field trial was conducted with 281 crossbred sows to study the effect of riboflavin supplementation (100 mg/day) from day 4 to day 10 after breeding. Differences between control and riboflavin treated sows were not significant for litter size born, litter size born alive, stillborn pigs per litter or mummies per litter. Significant linear and quadratic regressions of litter size born and litter size born alive on parity were observed. Significant linear regressions on the average number of stillborns or mummies per litter on parity were also observed. No significant riboflavin x parity interaction was observed for any trait measured.

(Key Words: Swine, Riboflavin, Reproduction, Parity.)

Introduction

Litter size born alive and weaned is of extreme economic importance in swine production. Thus research scientists are seeking potential methods of improving these economic traits. Bazer and Zavy (1988) reported that riboflavin concentrations increased in uterine flushings of cyclic and pregnant gilts between days 6 and 8 after onset of estrus and that additional riboflavin supplementation to gilts during this period resulted in increased litter size born and weaned. This study was conducted to determine if additional riboflavin supplementation from days 4 to 10 after breeding would result in increased litter size born in a highly productive sow herd on a commercial swine farm.

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Materials and Methods

The trial was conducted at the Hudson Foods Swine Farm near Colcord, Oklahoma with 281 crossbred sows. The sows were bred in confinement and were housed in individual confinement gestation stalls after breeding until day 111 of gestation. They were then moved to individual farrowing crates.

A gestation diet (Table 1) was fed to all sows at a level of 4 lb/day until day 84 of gestation and then increased to 5 lb. All sows were hand-fed a daily

Table 1. Composition of experimental diet.

Ingredients	%
Yellow corn, ground	57.546
Rice bran	29.829
Soybean meal, 47.5% CP	5.870
Meat and bone meal, 50%	3.160
Fat	.500
Dyna-K[a]	.750
Calcium carbonate	1.470
Salt	.400
Vitamin premix [b]	.200
Trace mineral premix [c]	.075
Choline chloride, 70%	.100
Aureo-100[d]	.100
Total	100.000
Calculated composition	
M.E. kcal/lb	1407
Crude protein, %	12.50
Lysine, %	.54
Calcium, %	.90
Phosphorus, %	.80
Riboflavin, mg/lb	3.84

[a] 50% potassium supplement - Pittman Moore Inc.

[b] Supplied 2,000,000 IU Vitamin A, 200,000 IU Vitamin D, 15,000 IU Vitamin E, 1500 mg riboflavin, 10,000 mg niacin, 7,000 mg pantothenic acid and 10 mg vitamin B-12 per lb premix.

[c] Supplies 55,000, 200,000, 100,000, 11,000, 200 and 1500 ppm per lb of premix for manganese, zinc, iron, copper, selenium and rodine, respectively.

[d] Chlorotetracycline, 100 g/lb.

supplemental wafer of wheat flour, molasses and vegetable oil from day 4 to day 10 after breeding. The level of supplemental riboflavin was 0 in the wafers fed the control sows and 100 mg in the wafers fed the riboflavin treated sows.

Results and Discussion

The results of the trial are shown in Table 2. Significant differences between the control sows and the riboflavin supplemented sows were not found for litter size born, litter size born alive, average number of stillborns or mummies per litter.

These results are not in agreement with the increased litter size of over one pig per litter of total pigs born or pigs born alive reported by Bazer and Zavy (1988) with females fed supplemental riboflavin utilizing the same method and levels as outlined in this paper. The study by Bazer and Zavy (1988) utilized gilts while the current study utilized primarily sows with two or more parities as shown in Table 3. Note that the parity 1 group in this study included only nine litters. This difference may explain the lack of agreement.

The effect of parity on litter size is shown in Table 3. The parity groupings used are based on the recommendation made by the National Swine Improvement Federation when adjusting sow productivity for parity.

Significant linear and quadratic regressions were observed for parity on both average litter size born and average litter size born alive as shown in Table 3. The largest litters of total born and born alive occurred during parities 4 through 7. Significant positive linear regressions of and average number of stillborns and number of mummies per litter on parity were also observed. No significant parity x treatment interaction was observed for any trait measured.

Table 2. Effect of riboflavin supplementation on performance of bred sows.

	Control	Riboflavin
Number litters	138	143
Mean litter size born	10.71	10.48
Mean litter size born alive	9.98	9.77
Mean stillborn/litter	.59	.48
Mean of mummies/litter	.10	.16

Table 3. Effect of parity on litter size.

	Parity				
	1	2	3	4-7	8-11
Number litters	9	35	47	145	45
Mean litter size born[a]	10.08	10.02	10.54	11.37	10.99
Mean litter size born alive[b]	9.75	9.62	9.91	10.36	9.72
Mean stillborn/litter[c]	.33	.26	.51	.77	.80
Mean of mummies/litter[d]	0	.05	.12	.22	.26

[a] Linear and quadratic effect (P<.01).
[b] Linear and quadratic effect (P<.02).
[c] Linear effect of (P<.03).
[d] Linear effect of (P<.08).

Literature Cited

Bazer, F.W. and M.T. Zavy. 1988. Supplemental riboflavin and reproductive performance of gilts. J. Anim. Sci. 66 (Suppl. 1):324.