

PSYLLIUM AS AN EFFECTIVE NATURAL LAXATIVE FOR SOWS AND GILTS DURING THE LATE GESTATION-LACTATION PERIOD

K. S. Sohn¹, T. M. Fakler² and C. V. Maxwell³

Story in Brief

A study involving 94 Hampshire and Yorkshire sows and gilts was conducted to determine the effect of psyllium fed during the late gestation-lactation period on sow productivity and fecal dry matter. Sows and gilts were allotted within breed and parity group to one of two dietary regimes which started 14 days prior to the time a weekly farrowing group was scheduled to be moved into the farrowing unit. Treatments were: 1) standard gestation-lactation control diet; and 2) the control diet with .3% psyllium. Sows were fed 6.0 lb per head daily until farrowing and then ad libitum throughout 21 days of lactation. Number of pigs weaned (7.88 vs 8.28), pig weaning weight (13.27 vs 13.81 lb), litter weaning weight (104.03 vs 113.02 lb) and percent survival to weaning (80.73 vs 82.38) were improved by 5.1, 4.1, 8.6 and 2.0%, respectively, by the inclusion of .3% psyllium in the diet. Sow weight loss from day of farrowing to 21 days postfarrowing was reduced by 9.0% in those fed psyllium (47.11 vs 51.77). Feed intake of sows was not affected by dietary treatment. Fecal dry matter on days 111 and 114 of gestation and days 7, 14, and 21 postfarrowing was decreased by 13.6, 19.0, 9.8, 11.2 and 9.6%, respectively, by the inclusion of .3% psyllium in the diet. This study suggests that psyllium can be used as an effective laxative for sows and gilts during the late gestation-lactation period.

(Key Words: Sow, Psyllium, Natural Laxative, Sow Productivity.)

Introduction

Constipation is a common problem for commercial swine producers with sows and gilts during the late gestation-lactation period. It has been suggested that constipation is associated withagalactia, resulting in reduced pig survival

¹Research Associate ²Graduate Assistant ³Professor

and weaning weight. Psyllium is a source of natural dietary fiber commonly used as a laxative for humans. The active ingredient is psyllium hydrophilic mucilloid, which is derived from seed hulls of plantain grown in India. Several investigators have examined the effects of psyllium on stool weight (Eastwood et al., 1978; Ornstein et al., 1981) and stool consistency (Stevens et al., 1988) for humans. Psyllium was found to increase stool weight and to increase fecal moisture weight in patients with diverticular disease and constipation. The efficacy of psyllium has not been properly tested in pregnant and lactating sows and gilts. This study was conducted to determine the effect of psyllium fed during late gestation and lactation on sow productivity and fecal dry matter.

Materials and Methods

A total of 94 Yorkshire and Hampshire sows and gilts were allotted within breed and parity group to one of two dietary regimes which began 14 days prior to the time a weekly farrowing group was scheduled to be moved into the farrowing unit. Treatments were: 1) standard gestation-lactation control diet (Table 1); and 2) the control diet with .3% psyllium. Both diets were fed at 6.0 lb per head daily until farrowing and were offered ad libitum throughout the 21 day lactation period. All sows and gilts were weighed at breeding, 110 days of gestation and 21 days postpartum, when litters were weaned. Pig weights and litter size were recorded at birth and 21 days of age. Feed intake of sows and gilts was recorded from farrowing to weaning. Fecal samples were collected on days 111 and 114 of gestation and 7, 14 and 21 of lactation for determination of fecal dry matter.

Results and Discussion

The effect of psyllium on sow productivity is presented in Table 2. Psyllium addition tended to improve the number of pigs weaned, pig weaning weight, litter weaning weight and percent survival to weaning. Least squares means for the number of pigs weaned (7.88 vs 8.28), pig weaning weight (13.27 vs 13.81 lb), litter weaning weight (104.03 vs 113.02 lb) and percent survival to weaning (80.73 vs 82.38) were improved by 5.1, 4.1, 8.6 and 2.0% respectively, by the inclusion of .3% psyllium in the diet. The higher average litter weaning weight in sows fed psyllium is a combination of improved survival and individual pig weight. Pigs weaned from sows consuming psyllium were .54 lb heavier than those from sows fed the control diet. Several investigators have suggested that feeding high dietary fiber diets such as

Table 1. Composition of experimental diets^a.

Ingredient	Treatment	
	Control	Psyllium
Corn,Gr	79.705	79.405
SBM, 44%	16.0	16.0
Lys,Hcl	.12	.12
Tylan 40-sulfa	.125	.125
Dicalcium phosphate	2.6	2.6
Calcium carbonate	.7	.7
Vit-Min-Mix ^b	.25	.25
Salt	.50	.50
Psyllium	---	.30
	100	100
Calculated Analysis		
ME(Kcal/lb)	1475.21	1470.55
Crude Protein,%	13.91	13.88
Calcium,%	.91	.91
Phosphorus,%	.81	.81
Lysine,%	.76	.76
Threonine,%	.56	.56
Tryptophan,%	.17	.17
Met + Cys,%	.51	.51

^aAs fed basis.^bSupplied 2,000 IU vitamin A, 200 IU vitamin D, 8.5 IU vitamin E, 10 mg pantothenic acid, 13.5 mg niacin, 2.0 mg riboflavin, .007 mg vitamin B₁₂, 129 mg choline, .05 mg selenium, .01 mg manganese, .005 g zinc, .05 g iron, .05 g copper, .11 mg iodine per lb of feed.

alfalfa, corn gluten feed and sunflower hulls during gestation may improve sow productivity (Danielson and Noonan, 1975; Pollmann et al., 1981; Carter et al., 1987; Honeyman and Zimmerman, 1990). The present study suggests that concentrated fiber sources fed at low dietary levels may have effects similar to those observed in sows fed high fiber diets. Lower level of dietary fiber can shift digestion of feedstuffs from the pre-ileal to post-ileal digestion (Cannon, 1985). In addition, feeding low levels of a concentrated fiber source may avoid the detrimental effect of energy dilution observed in sows fed high fiber diets during lactation (Colvert et al., 1985).

Table 2. The effect of psyllium fed during the late gestation-lactation period on sow productivity^a.

Item	Treatment		
	Control	Psyllium	SE
Number of sows	49	45	
Number of pigs/sow	10.24	10.38	.63
Birth weight, lb	2.99	3.10	.09
Weaning weight, lb	13.27	13.81	.39
Number weaned/litter	7.88	8.28	.55
Litter weaning weight, lb	104.03	113.02	6.47
Survivability, %	80.73	82.38	3.15
Feed intake/day/sow, lb	10.68	10.86	.32
Sow weight loss, lb	51.77	47.11	4.85

^aLeast squares means.

Weight loss from day of farrowing to 21 day postfarrowing was reduced by 9.0% in sows fed psyllium (51.77 vs 47.11 lb). This is consistent with results reported by Pollman et al. (1981) who observed that bred sows fed a 50% alfalfa-hay diet lost less weight during lactation when compared to sows fed a corn-soybean meal diet. Feed intake during lactation has been shown to be enhanced by feeding gestation diets containing high levels of alfalfa-orchard grass (Holzgraefe et al., 1986) and high levels of corn gluten feed (Honeyman and Zimmerman, 1990). This may be due to lower gestation weight gain, reduced backfat deposition during gestation (Pollman et al., 1979; Holzgraefe et al., 1986) or high fiber diets may enhance lactation appetite by increasing digestive tract capacity (Kuan et al., 1983).

Psyllium consistently increased the amount of water present in feces and therefore reduced fecal dry matter (Table 3). Fecal dry matter on days 111 and 114 of gestation and days 7, 14 and 21 postfarrowing was decreased (as a percent of control diet) by 13.6 (50.48 vs 43.66, $P<.01$), 19.0 (47.77 vs 38.70, $P<.01$), 9.8 (43.51 vs 39.25, $P<.07$), 11.2 (41.15 vs 36.55, $P<.07$) and 9.6 (36.59 vs 33.08, $P<.08$) %, respectively, by the inclusion of .3% psyllium in the diet. Sows fed the psyllium-supplemented diet had looser stools, especially during the late gestation period.

This study suggests that psyllium can be used as an effective laxative for sows and gilts during the late gestation-lactation period and may improve sow productivity. This study also suggests that concentrated fiber sources fed at low dietary levels may have effects similar to those observed in sows fed high fiber diets. In addition, feeding low levels of a concentrated fiber source may avoid the detrimental effect of energy dilution observed in sows fed high fiber diets during lactation.

Table 3. The effect of psyllium fed during the late gestation-lactation on period on fecal dry matter^a.

Day	Treatment		SE
	Control	Psyllium	
Number of sows	49	45	
Fecal dry matter, %			
D 111 gestation	50.48 ^b	43.60 ^c	1.66
D 114 gestation	47.77 ^b	38.70 ^c	2.43
D 7 postfarrowing	43.51 ^d	39.25 ^e	1.65
D 14 postfarrowing	41.15 ^d	36.55 ^e	1.77
D 21 postfarrowing	36.59 ^d	33.08 ^e	1.44

^aLeast squares means.

^{b,c}Means in the same row with different superscripts differ ($P < .01$).

^{d,e}Means in the same row with different superscripts differ ($P < .09$).

Literature Cited

- Cannon, W. N. 1985. Effects of dietary fiber on digestion, blood plasma lipids, and gastrointestinal tract parameters in nonruminants. Ph.D. Thesis. Oklahoma State Univ, Stillwater.
- Carter, D. et al. 1987. Added bulk in gestating sow diets improves sow and litter performance. North Dakota State Univ. Swine Res. Rep. NDSU, Fargo.
- Colvert, C. C. et al. 1985. Digestibility of fiber components and reproductive performance of sows fed high levels of alfalfa meal. *J. Anim. Sci.* 61:595.
- Danielson, D. M and J. J. Noonan. 1975. Roughage in swine gestating diets. *J. Anim. Sci.* 41:94.
- Eastwood, M.A. et al. 1978. Comparison of bran, ispaghula and lactulose on colon function in diverticular disease. *Gut.* 19:1144.
- Holzgraeffe, D. P. et al. 1986. Effects of dietary alfalfa, orchardgrass hay, and lasalocid on sows reproductive performance. *J. Anim. Sci.* 62:1145.
- Honeyman, M. S and D. R. Zimmerman. 1990. Long-term effects of corn gluten feed on the reproductive performance and weight of gestating sows. *J. Anim. Sci.* 68:1329.
- Kuan, K. K. et al. 1983. The effect of proportion of cell wall material from lucern leaf meal on apparent digestibility, rate of passage and gut characteristics in pigs. *Anim. Prod.* 36:201.

- Ornstein, M. H. 1981. Are fiber supplements really necessary in diverticular disease of the colon? A controlled clinical trial. *Br. Med. J.* 282:1353.
- Pollman, D. S. et al. 1979. Value of high fiber diets for growing swine. *J. Anim. Sci.* 48:1385.
- Pollman, D. S. et al. 1981. Long-term effects of dietary additions of alfalfa and tallow on sow reproductive performance. *J. Anim. Sci.* 51:294.
- Stevens, J. et al. 1988. Comparison of the effects of psyllium and wheat bran on gastrointestinal transit time and stool characteristics. *J. Am. Diet. Assoc.* 88:323.