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Fat in late gestation sow diets: effects on pig survival and growth

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FAT IN LATE GESTATION SOW DIETS: EFFECTS ON PIG SURVIVAL AND GROWTH[1]

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Summary

An on-farm experiment was conducted utilizing 140 sows to compare the effect of feeding either fat or additional corn during late gestation on subsequent pig performance. Beginning on day 100 of gestation and until the day of farrowing, sows were fed 6 lb daily of a corn-soybean meal diet top-dressed with either 1 lb of fat or 2.25 lb of corn. Litter size was equalized within 24 hr of farrowing. Feeding fat to sows during late gestation increased ($P<.05$) the number of pigs weaned per litter by .4 pig compared to feeding additional corn. Sows fed supplemental fat during late gestation weaned heavier litters ($P=.06$) compared to sows fed extra corn. These results indicate that feeding fat during late gestation to sows with a high energy intake increased pig survival over that obtained when the same calories were provided with corn.

Introduction

A major economic objective in the swine industry is to increase the number of pigs marketed per sow per year. Studies show that 13 to 25% of the pigs born alive die before weaning. Research reports indicate that 65 to 70% of pig preweaning death losses occur within the first 3 days of birth and the single largest cause of pig mortality may be insufficient energy reserves. Previous studies have shown an increased preweaning pig survival when fat is added to the sow's diet before farrowing. Supplemental dietary fat during late gestation increases milk production and the fat concentration of colostrum and milk. This improvement in milk quality is observed if at least 2.5 lb of fat is consumed by the sow and this quantity of fat is spread over a minimum of 7 days immediately before farrowing.

Experimental Procedure

A total of 140 Duroc and Yorkshire sows (producing purebred and F_1 litters) were randomly assigned by parity and breed to one of two dietary treatments during late gestation with either corn or fat provided as a supplemental energy source. All sows received 5 lb daily of a corn-soybean meal (14% protein) diet fortified with vitamin and minerals until day 100 of gestation. Beginning on day 100 of gestation, sows were fed 6 lb daily of a corn-soybean meal diet top-dressed with either an additional 1.25 lb of dried fat[3] (1 lb of actual fat) or 2.25 lb of corn. Dietary treatments were provided until farrowing. Sows were full-fed a corn-

[1]We acknowledge Porters Porker Partnership for allowing this trial to be conducted on their farm. Special thanks to Roy Claycamp for helping collect the experimental data.

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[3]Merrick Foods 4-80®

soybean meal diet (14% crude protein) during lactation. At farrowing number of pigs born alive, number of stillborns and pig birth weights were recorded. Litter size was equalized by transferring pigs among sows within 24 hr after farrowing. On day 21 of lactation pig weights were recorded and the experiment was terminated. Creep feed was not available to pigs during lactation.

Results and Discussion

The effect of source of energy intake of sows during late gestation on subsequent pig performance is shown in table 1. Sows supplemented with fat during late gestation farrowed a slightly higher number of live pigs and weaned an additional .4 pig per litter compared to sows provided corn as a supplemental energy source. This improvement in number of pigs weaned appears to be the result of a higher preweaning survival rate for litters from sows fed fat. Birth weight of pigs was not affected by providing supplemental fat to sows during late gestation, nor was the average pig weaning weight influenced by the source of energy intake during late gestation. However, as a result of increased number of pigs weaned, litter weights on day 21 of lactation were 2.5 lb greater (P=.06) for sows fed fat compared to those fed additional corn during late gestation.

Effects of breed of litter on pig performance are shown in table 2. Breed of the litter did not affect the number of pigs born alive or number of stillborns per litter. However, breed of the litter influenced number of pigs weaned per litter, preweaning pig survival and litter weaning weights. Pigs from Duroc litters had a lower preweaning survival rate and were lighter (P<.01) at weaning compared to pigs from Yorkshire and F_1 litters.

The influence of sow parity on pig performance is illustrated in table 3. Sows that were seventh parity or older had fewer pigs born alive and number of pigs weaned per litter compared to younger sows. Likewise, old sows (>6 parities) weaned litters that were 16% lighter compared to younger sows (<7 parities).

Table 1. Effect of Source of Sow Energy Intake on Subsequent Pig Performance

Item	Fat[a]	Corn[b]
No. of litters	70	70
Live born/litter[c]	10.8	10.3
Stillborns/litter	.8	.7
No. of pigs equalized, day 1	10.0	9.9
No. of pigs weaned, day 21[d]	8.7	8.3
Pig survival, %[e]	87.0	84.3
Pig performance (lb)		
Avg. pig birth wt	2.9	2.9
Avg. litter birth wt	28.8	28.6
Avg. pig 21 day wt	11.1	10.9
Avg. litter 21 day wt[c]	95.4	92.9

[a]Fat was top-dressed on the sows' feed at 1.0 lb actual fat for 14 days prior to farrowing.
[b]Corn was top-dressed on the sows' feed at 2.25 lb for 14 days prior to farrowing.
[c]Treatment difference (P=.06).
[d]Treatment difference (P<.05).
[e]Treatment difference (P=.08).

Table 2. Effect of Breed of Litter on Pig Performance

Item	Litter Breed		
	F_1[a]	Duroc	Yorkshire
No. of litters	35	42	63
Live born/litter	10.6	10.4	10.6
Stillborns/litter	.6	.9	.7
No. of pigs equalized, day 1[b]	10.3	9.5	10.2
No. of pigs weaned, day 21[c]	9.1	7.6	8.9
Pig survival, %[d]	88.1	80.8	87.5
Pig performance (lb)			
Avg. pig birth wt[c]	2.9	3.1	2.7
Avg. litter birth wt[c]	30.0	29.1	27.7
Avg. pig 21 day wt[c]	10.9	10.4	11.5
Avg. litter 21 days wt[c]	97.8	79.4	101.9

[a] F_1 litters include Yorkshire x Duroc litters and Duroc x Yorkshire litters.
[b] Breed difference ($P<.05$).
[c] Breed difference ($P<.01$).
[d] Breed difference ($P=.06$).

Table 3. Effect of Parity on Pig Performance

Item	Sow Parity Group[a]		
	Young	Intermediate	Old
No. of litters	81	46	13
Live born/litter[b]	10.6	11.0	9.2
Stillborns/litter	.7	.6	1.2
No. of pigs equalized, day 1	10.0	10.2	9.3
No. of pigs weaned, day 21[c]	8.7	8.6	7.3
Pig survival, %	87.5	84.0	79.2
Pig performance (lb)			
Avg. pig birth wt	2.9	2.8	3.0
Avg. litter birth wt	28.8	28.7	27.9
Avg. pig 21 day wt	11.1	11.0	10.8
Avg. litter 21 days wt[d]	96.4	94.4	79.2

[a] Young sows are those nursing their second or third litter, intermediate parity were nursing their fourth, fifth or six litters and old sows were nursing their seventh or eighth litters.
[b] Parity difference ($P<.06$).
[c] Parity difference ($P<.01$).
[d] Parity difference ($P<.05$).