Table 3. Average litter size and survival rate

Treatment	Number of live pigs			Survival rate		
	Birth	21 days lactation	42 days (weaning)	Birth[1]	21 days lactation	42 days[3] (weaning)
Normal intake	9.5	7.6	7.1	90.8	80.9	76.4
High intake	8.7	7.5	7.1	88.8	86.9	82.2

[1]Number of pigs born alive ÷ total pigs born.
[2]Number of pigs alive at 21 days ÷ number of pigs born alive.
[3]Number of pigs alive at 42 days ÷ number of pigs born alive.

Table 4. Least square means of pig weights for each treatment

	Treatment	
	Normal intake (lb)	High intake (lb)
Birth	2.8	3.0
21 days	11.2	11.4
42 days (weaning)	22.5	22.5

This is a preliminary report on a study that is approximately one-half complete; therefore, additional replications of this study will provide more precise measurement of the effect of increased feed intake during late gestation.

Effects of Fat Supplementation on Performance of Creep-Fed Pigs

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Story in Brief

The effects of fat supplementation on the performance of creep-fed pigs from 3 to 6 weeks of age and on post-weaning performance from 6 to 10 weeks of age were studied in a trial utilizing 60 litters consisting of 425 Yorkshire pigs. The treatments were a non-supplemented 18 percent corn-soybean meal control diet and the control diet plus 5 percent choice white grease. Ration adjustments were made to maintain a constant ratio of energy to other nutrients. Treatment did not significantly affect survival rate or feed intake over the entire experiment but did significantly ($P<.05$) affect weight. In general, pigs on fat-supplemented rations attained heavier weights at 10 weeks of age. However, this general trend was not consistent for each season in which the litters were farrowed and for each parity of the dam. Based on the results of this experiment, it appears that adding 5 percent choice white grease to creep rations and to rations for pigs during the post-weaning period may be beneficial. However, with results not being consistent across seasons and parity groups, one should carefully consider the economical feasibility of adding choice white grease to creep rations since fat does increase ration cost.

Introduction

When pigs are weaned, they undergo a weaning stress period that is characterized by decreased gains or weight loss and increased death rate. Weaning stress may be attributed to a drastic change in diet as well as environment. It has been suggested that feeding diets supplemented with a high-quality fat may improve pig performance prior to weaning and may reduce weaning problems and improve feed conversion since fat is a major source of energy in sow's milk and would represent less of a dietary change for weaned pigs. Few studies have been conducted to determine the feasibility of increasing fat in creep ration. This study was conducted to determine the effect on pig survivability and performance of adding fat to creep rations.

Materials and Methods

A feeding experiment was conducted with a total of 425 Yorkshire pigs from 60 litters to evaluate the effects of fat supplementation in creep rations fed to pigs from 3 to 6 weeks of age and to pigs during the post-weaning period from 6 to 10 weeks of age. The treatments were a non-supplemented corn-soybean meal control diet containing 18-percent protein and the control ration supplemented with 5 percent choice white grease. Ration adjustments were made to maintain a constant ratio of energy to other nutrients. All litters were randomly assigned from within gilt or sow litters to non-supplemented control or control with 5 percent fat (Figure 1).

Figure 1. Treatment breakdown for 3-10 week period

	3 weeks to 6 weeks	6 weeks to 10 weeks
Gilt Litter	1. Odd litter - Non-supplemented creep	a. Non-supplemented b. Fat supplemented
	2. Even litter - Fat supplemented creep	a. Fat supplemented b. Non-supplemented
Sow Litters	3. Odd litter - Non-supplemented creep	a. Non-supplemented b. Fat supplemented
	4. Even litter - Fat supplemented creep	a. Fat supplemented b. Non-supplemented

The pigs were weaned at 6 weeks of age, and at this time each litter was again randomly assigned to a treatment with one-half of the litters receiving the same diet (a) they received from 3-6 weeks and the other half receiving the opposite diet (b). This provided a total of four treatments over the period of 3-10 weeks of age for gilt and sow litters.

Litters were maintained in pens with either solid concrete floors or oak slatted flooring. A hover area and heat lamps were available to provide heat for pigs during periods of low temperature. Foggers were provided for cooling the sow and litter during periods of high temperature. Creep feed and water were offered *ad libitum*. The quantity of feed offered and feed refused were recorded for the 3-6, 6-8 and 8-10 week period for each litter. Individual pig weights were recorded at birth, 3,6,8 and 10 weeks of age. All weights were taken at approximately the same time of day. The number of pigs born per litter, the number of pigs born alive per litter, sex of pigs in each litter and the number of live pigs per litter at 3,6,8 and 10 weeks were also recorded.

This experiment involved three farrowing seasons during 1979 and 1980 as follows: Farrowing Season 1 (January-March, 1980), Farrowing Season 2 (July-September, 1979), and Farrowing Season 3 (October-December, 1979).

Table 1. Least squares means of feed intake and weight for each treatment from 3-6 weeks, treatment from 6-10 weeks and farrowing season

Treatment 3-6 weeks	Treatment 6-10 weeks	Farrowing season	Feed intake[1] (lb)			Weight (lb)	
			6-8 week	8-10 week	3-10 week	8 week	10 week
Non-supp.	Non-supp.	Jan-Mar	195	212	444	34	53
Non-supp.	Non-supp.	Jul-Sept	229	283	527	35	46
Non-supp.	Non-supp.	Oct-Dec	99	288	428	31	49
		Average	174	261	467	33	49
Non-supp.	Fat-supp.	Jan-Mar	145	226	396	32	54
Non-supp.	Fat-supp.	Jul-Sept	171	271	468	39	56
Non-supp.	Fat-supp.	Oct-Dec	118	339	478	34	51
		Average	145	279	447	35	53
Fat-supp.	Non-supp.	Jan-Mar	144	241	438	38	57
Fat-supp.	Non-supp.	Jul-Sept	271	351	648	41	61
Fat-supp.	Non-supp.	Oct-Dec	129	208	373	30	45
		Average	181	267	486	37	54
Fat-supp.	Fat-supp.	Jan-Mar	142	255	431	36	59
Fat-supp.	Fat-supp.	Jul-Sept	153	257	446	41	53
Fat-supp.	Fat-supp.	Oct-Dec	81	238	328	30	46
		Average	125	250	402	36	53

[1]Mean litter intake corrected for litter size.

Table 2. Least squares means of feed intake and weight for each treatment from 3-6 weeks, parity of dam and farrowing season

Treatment 3-6 weeks	Parity of dam	Farrowing season	Feed intake[1] (lb)				Weight (lb)		
			3-6 week	6-8 week	8-10 week	3-10 week	6 week	8 week	10 week
Non-supp.	Gilt	Jan-Mar	29	163	188	401	21	32	51
Non-supp.	Gilt	Jul-Sept	26	225	319	565	24	32	47
Non-supp.	Gilt	Oct-Dec	27	116	317	448	23	32	49
		Average	27	168	275	472	23	32	49
Non-supp.	Sow	Jan-Mar	27	176	249	439	23	35	56
Non-supp.	Sow	Jul-Sept	21	175	235	430	27	41	54
Non-supp.	Sow	Oct-Dec	33	101	310	458	24	33	50
		Average	27	151	265	442	25	36	54
Fat-supp.	Gilt	Jan-Mar	53	129	282	474	24	37	59
Fat-supp.	Gilt	Jul-Sept	24	238	302	554	24	35	49
Fat-supp.	Gilt	Oct-Dec	14	108	155	284	22	28	41
		Average	30	158	247	437	23	33	50
Fat-supp.	Sow	Jan-Mar	30	156	213	396	25	37	57
Fat-supp.	Sow	Jul-Sept	36	186	306	540	30	47	65
Fat-supp.	Sow	Oct-Dec	34	102	290	417	26	33	50
		Average	33	148	270	451	27	39	57

[1]Mean litter intake corrected for litter size.

Table 3. Least squares means of feed intake and weight for each treatment from 6-10 weeks, parity of dam and farrowing season

Treatment 6-10 weeks	Parity of dam	Farrowing season	Feed intake[1] (lb)			Weight (lb)	
			6-8 week	8-10 week	3-10 week	8 week	10 Week
Non-supp.	Gilt	Jan-Mar	138	248	454	35	55
Non-supp.	Gilt	Jul-Sept	300	355	667	33	47
Non-supp.	Gilt	Oct-Dec	125	214	377	30	46
		Average	188	272	500	33	49
Non-supp.	Sow	Jan-Mar	200	204	428	37	55
Non-supp.	Sow	Jul-Sept	200	279	508	43	60
Non-supp.	Sow	Oct-Dec	104	283	424	30	47
		Average	168	255	453	37	54
Fat-supp.	Gilt	Jan-Mar	154	222	421	34	54
Fat-supp.	Gilt	Jul-Sept	162	267	453	35	50
Fat-supp.	Gilt	Oct-Dec	100	259	355	30	44
		Average	139	249	409	33	49
Fat-supp.	Sow	Jan-Mar	132	258	407	35	58
Fat-supp.	Sow	Jul-Sept	161	261	461	44	59
Fat-supp.	Sow	Oct-Dec	131	279	440	38	57

[1]Mean litter intake corrected for litter size.

Table 4. Least squares means of feed intake and weight for each treatment from 3-6 weeks, treatment from 6-10 weeks and parity of dam

Treatment 3-6 weeks	Treatment 6-10 weeks	Parity of dam	Feed intake[1] (lb)			Weight (lb)	
			6-8 week	8-10 week	3-10 week	8 week	10 week
Non-supp.	Non-supp.	Gilt	185	273	483	31	47
Non-supp.	Non-supp.	Sow	164	249	450	36	51
		Average	174	261	467	33	49
Non-supp.	Fat-supp.	Gilt	151	277	460	34	51
Non-supp.	Fat-supp.	Sow	138	280	435	37	56
		Average	145	279	477	35	53
Fat-supp.	Non-supp.	Gilt	191	271	516	35	52
Fat-supp.	Non-supp.	Sow	172	262	457	38	57
		Average	181	267	486	36	54
Fat-supp.	Fat-supp.	Gilt	126	222	359	32	47
Fat-supp.	Fat-supp.	Sow	124	278	445	39	58
		Average	125	250	402	36	53

[1]Mean litter intake corrected for litter size.

Results and Discussion

Treatment and sex of pig did not significantly affect survival rates or feed consumption during any period of this experiment. The overall mean survival rates were 97.7, 98.7, 97.1 and 93.6 percent for the 3-6, 6-8,8-10 and 3-10 week periods,respectively. Survival rates were calculated as the number of pigs alive at the end of the period divided by the number of pigs starting that period. The variation in the feed intake was so great that no significant differences in feed intake were found. Because of this large variation, drawing conclusions on feed intake could be very misleading.

In general, pigs fed the fat-supplemented diet attained significantly heavier weights ($P<.05$) at 8 and 10 weeks of age than pigs fed non-supplemented creep rations. However, the effect of fat appears to be influenced by the season in which the litter was farrowed. Supplemental fat tended to increase weight in litters farrowed in January-March and July-September but shows no beneficial effect in the October-December farrowing season (Table 1). Pigs from sows were significantly heavier ($P<.05$) than pigs from gilts regardless of treatment (Tables 2 and 3).

Pigs from sow litters fed fat-supplemented creep feed from 3-6 weeks of age were significantly heavier ($P<.05$) at 6, 8 and 10 weeks of age than pigs from sow litters fed the non-supplemented creep ration during this same period. Pigs from gilt litters did not differ significantly in weight between those fed fat-supplemented or non-supplemented creep feed from 3-6 weeks of age (Table 2). Weight is affected also by the season in which the litter is farrowed. Feeding fat-supplemented creep feed from 3-6 weeks of age tended to increase pig weight from both sow and gilt litters farrowed in January-March and July-September but seemed to have little effect on pigs farrowed in October-December (Table 2).

Within the October-December farrowing season, pigs from sow litters on fat-supplemented diets from 6-10 weeks of age were heavier ($P<.05$) at 8 and 10 weeks of age than those on non-supplemented diets (35 and 54 vs. 31 and 47 lb, respectively). This beneficial effect did not occur in the other two seasons (Table 3). Supplemental fat appeared to have little effect on pigs from gilt litters when fed from 6-10 weeks of age (Table 3).

Since only one year is represented in these data, differences in the effect of supplemented fat due to different seasons may not be real. Averaged over seasons, pigs from sow litters receiving fat-supplemented feed for the entire 3-10 week period tend to be heavier than pigs receiving non-supplemented feed while pigs from gilt litters showed little response to fat-supplemented feed (Table 4).

Based on these data, adding fat to creep rations could be beneficial. However, results have not been consistant across seasons and parity groups. Further studies are needed to determine whether fat supplementation is beneficial.