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Evaluation of Dried Skim Milk, Dried Whey, and Fat in Pig Starters

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Summary

Five starters were compared with a corn-soybean meal standard with 15% skim milk and 12% sugar. Rations containing dried skim milk or dried whey with 3 or 5% added edible fat also were compared. The rations were offered to suckling baby pigs from 2 to 4 weeks (phase 1) and again during 6 to 10 weeks of age (phase 2).

During phase 1, neither feed intake nor total gain differed significantly. During phase 2 all rations produced similar weight gains and feed intake. Feed efficiency favored rations containing dried skim milk and 3 or 5% added fat. Rations containing more fat produced more efficient gains.

Procedure

Phase 1. Creep rations were assigned randomly to each litter. Each litter was weighed when 14 days and again when 28 days old. The pelleted creep ration was offered to the pigs on day 14. All creeps were located near the rear of the farrowing crate in a well lighted area. When the creep ration was not consumed in 3 days, fresh feed was added. Feed wastage could not be determined because the farrowing pen is slotted. Suckling pigs had access to water while creep fed.

Phase 2. Post-weaning studies were conducted using the five starter rations 4 weeks and starting when pigs were approximately 6 weeks old. Two hundred pigs were lotted to 5 treatment groups with 4 replications. The pigs were housed in the nursery wing where the pens are totally slotted with a circulating oxidation ditch below. Each 6x11 foot pen contains an automatic waterer and a 2-hole self-feeder. Pigs were lotted to balance breed, litter, and sex.

Results and Discussion

Pigs had similar feed intakes and rates of gain on the five starter rations during the creep period. Average feed intake per pig for the two-week creep period was 1.17 lbs.; average gain, 6.81 lbs. (Table 9). Feed intake per pig seemed to favor rations containing 5% added fat.

Table 7. Composition of Basal Starter Ration

Ingredient	Pounds per ton of ration
Ground yellow corn	703
Rolled oat groats	300
Soybean meal (50%)	380
Sugar	240
Dried skim milk	300
Ground limestone	8
Dicalcium phosphate	24
Salt	10
TNT[1]	25
Vit-min permix[2]	10

[1] Contains 4 grams oxytetracycline hydrochloride, 2.8 grams neomycin, and 400,000 U.S.P. units Vit. A palmitate per pound.

[2] Contains 900,000 I.U. of Vit. D_3, 48 grams of Niacin, 16 grams of Riboflavin, 32 grams pantothenic acid, 160 grams of choline chloride, 40 milligrams of Vit. B_{12}, 88 I.U. of Vit. E, 100 ppm Mn, 100 ppm Fe, 50 ppm Zinc, 10 ppm Cu, 3 ppm Iodine, and 1 ppm cobalt.

Table 8. Analyses of Starter Rations Fed

Ration	106 Skim milk	106A Sk. milk +3% Fat	106B Sk. milk +5% Fat	106C Whey +3% Fat	106D Whey +5% Fat
Crude protein	19.1	19.9	19.8	20.1	19.3
Ether extract	3.02	4.87	7.17	3.63	5.54
Crude fiber	1.69	1.76	1.67	1.65	1.74
Total ash	5.17	5.06	5.10	5.65	5.40
Calcium	.78	.71	.69	.68	.75
Phosphorous	.70	.69	.69	.68	.68

Both 106B and 106D rations seemed to be a softer pellet, which may have enhanced feed intake.

In phase 2, there was no significant difference in average daily gain or daily feed intake (Table 10), but feed required per pound of gain differed significantly. Feed utilization did favor the skim milk ration with 5% added fat, but the least efficient ration was the skim milk with no added fat, and dried whey with 3% added fat--both similar in total fat content.

Table 9. Growth and Starter Ration Intake by Pigs from 14 to 28 Days of Age

Ration	106[1]	106A[2]	106B[3]	106C[4]	106D[5]
July litters	5	4	5	5	5
No. pigs	46	33	50	47	49
Avg. gain/pig, lbs.	6.64	6.22	6.55	6.92	6.06
Avg. feed intake/pigs, lbs.	1.26	.95	1.33	1.02	1.56
September litters	5	5	6	5	5
No. pigs	37	41	45	47	30
Avg. gain/pig, lbs.	6.87	7.66	7.34	6.48	7.62
Avg. feed intake/pigs, lbs.	.96	.63	1.11	.95	1.90
All litters	10	9	11	10	10
No. pigs	83	74	95	94	79
Avg. gain/pig, lbs.	6.74	7.02	6.93	6.70	6.65
Avg. feed intake/pig, lbs.	1.12	.78	1.23	1.00	1.69

1 Basal ration (15% skimmed milk)
2 Basal ration plus 3% added fat
3 Basal ration plus 5% added fat
4 Dried whey replacing skimmed milk plus 3% added fat
5 Dried whey replacing skimmed milk plus 5% added fat

Table 10. Phase 2 - Growth Performance of Nursery Age Pigs (6-10 Wks) on Starter Rations

Starter	106 Skim milk	106A Sk-milk +3% Fat	106B Sk-milk +5% Fat	106C Whey +3% Fat	106D Whey +5% Fat
Average initial weight, lbs.					
Rep. 1	38.3	40.5	38.8	39.6	40.5
Rep. 2	36.4	39.6	39.6	38.9	37.0
Rep. 3	32.7	36.6	33.3	33.4	34.1
Rep. 4	28.4	24.5	27.4	26.2	25.0
Avg.	33.9	35.3	34.8	34.5	34.2
Average final weight, lbs.					
Rep. 1	68.9	68.8	70.9	71.1	74.0
Rep. 2	72.3	71.2	71.2	68.4	69.5
Rep. 3	57.3	66.9	65.8	61.7	61.5
Rep. 4	50.6	48.6	51.9	48.0	48.0
Avg.	62.3	63.9	65.0	62.3	63.3

Starter	106 Skim milk	106A Sk-milk +3% Fat	106B Sk-milk +5% Fat	106C Whey +3% Fat	106D Whey +5% Fat
Average daily gain, lbs.					
Rep. 1	1.07	1.01	1.15	1.13	1.20
Rep. 2	1.02	1.13	1.13	1.05	1.16
Rep. 3	0.88	1.08	1.16	1.01	0.98
Rep. 4	0.79	0.86	0.88	0.78	0.82
Avg.	0.94	1.02	1.08	0.99	1.04
Average daily feed intake, lbs.					
Rep. 1	2.28	2.22	2.21	2.38	2.45
Rep. 2	2.43	2.21	2.15	2.28	2.30
Rep. 3	1.89	1.97	2.05	2.18	2.09
Rep. 4	1.71	1.64	1.77	1.63	1.70
Avg.	2.08	2.01	2.04	2.12	2.13
Average lbs. feed per lb. of gain					
Rep. 1	2.09	2.20	1.92	2.12	2.04
Rep. 2	2.14	1.96	1.90	2.16	1.98
Rep. 3	2.15	1.82	1.77	2.16	2.09
Rep. 4	2.15	1.90	2.02	2.09	2.06
Avg.	2.13	1.97	1.90	2.13	2.04