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The effects of added salt in the phase II starter pig diet

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THE EFFECTS OF ADDED SALT IN THE PHASE II STARTER PIG DIET¹

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Summary

A total of 178 pigs (initially 10.5 lb and 19 d of age) was used to compare the effects of added salt in the Phase II (d 14 to 28 postweaning) diet. Pigs were allotted by sex and initial weight and placed in pens containing either nine or 10 pigs. All pigs were fed the same Phase I diet for the first 14 d postweaning. The Phase I diet contained 20% dried whey, 7.5% spray-dried porcine plasma (SDPP), and 1.75% spray-dried blood meal (SDBM) and was formulated to contain 1.5% lysine and .42% methionine. On day 14, pigs were assigned to one of three diets that contained either 3.5 or 7 lb/ton added salt or no salt. The Phase II diet was corn-soybean meal-based, contained 10% dried-whey and 2.5% SDBM, and was formulated to contain 1.25% lysine and .34% methionine. During Phase I (d 0 to 14 postweaning), average daily gain (ADG), average daily feed intake (ADFI), and feed efficiency (F/G) were .52 lb, .63 lb, and 1.2, respectively. During Phase II (d 14 to 28 postweaning), ADG and F/G tended to improve with increasing added salt (8 and 9%, respectively). For the cumulative period (d 0 to 28 postweaning), numerical increases also occurred in both ADG and F/G. These results suggest that up to 7 lb/ton of added salt in a Phase II diet containing 10% dried whey improves ADG and F/G of starter pigs.

(Key Words: Starter, Performance, Salt.)

Introduction

Sodium and chlorine (salt) are responsible for maintaining the cation-anion balance of cells. Perhaps more important is the role that salt plays in stimulating appetite and feed intake. Generally, 5 to 7 lb of salt are added per ton in diets for growing-finishing pigs and approximately 10 lb per ton in gestation and lactation diets. However, little, if any salt is added to diets for starter pigs containing dried whey and spray-dried plasma protein. This is because these ingredients generally contain moderate levels of salt (approximately 3% salt in good quality dried whey and 5 to 2.9% sodium in spray-dried plasma protein). However, with recent changes in the sodium content of spray-dried porcine plasma and the increased use of lactose in place of dried whey, the need for added salt in starter pigs diets becomes a concern. Therefore, the objective of this experiment was to determine if added salt in a starter pig diet containing 10% dried whey would improve pig growth performance.

Procedures

A total of 178 pigs (initially 10.5 lb and 19 d of age) was used in a 28-d growth trial. Pigs were allotted by sex, weight, and ancestry and placed in pens containing nine or 10 pigs each. A common Phase I diet was fed for the first 14 d postweaning. The Phase I diet contained 20% dried whey, 7.5%

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SDPP, and 1.75% SDBM and was formulated to contain 1.5% lysine and .42% methionine. After the Phase I period, pens were assigned randomly to one of three treatments in a randomized complete block design. During Phase II (d 14 to 28 postweaning), pigs were fed diets that contained 3.5 or 7 lb/ton added salt or no salt. The Phase II diet contained 10% dried-whey and 2.5% SDBM and was formulated to contain 1.25% lysine and .34% methionine and fed in a meal form.

Pigs were housed in 5 ft × 5 ft pens (9 to 10 pigs per pen) in an environmentally-controlled nursery facility on a commercial farm in northeast Kansas. Each pen contained two nipple waterers, and pigs were allowed ad libitum access to feed and

water. Pigs and feeders were weighed on d 7, 14, 21, and 28 to calculate ADG, ADFI, and F/G.

Results and Discussion

During Phase I, ADG, ADFI, and F/G were .52 lb, .63 lb, and 1.2, respectively. From d 14 to 28 postweaning, pigs fed added salt had a numerical increase in ADG ($P < .12$) and were more efficient ($P < .07$). This trend also held true for the cumulative period (d 0 to 28 postweaning). In conclusion this growth assay suggests that salt typically obtained from the 10% added whey is not enough to maximize pig performance. Adding up to 7 lb/ton of salt to the Phase II diet improved ADG and F/G 8 and 9%, respectively.

Table 1. Diet Composition,^a %

Item	Phase I	Phase II ^b
Corn	45.29	59.26
Soybean meal, (48% CP)	16.13	21.26
Dried whey, edible grade	20.00	10.00
Spray-dried porcine plasma	7.50	--
Spray-dried blood meal	1.75	2.50
Soybean oil	5.00	3.00
Monocalcium phosphate	1.91	1.97
Limestone	.69	.83
Antibiotic ^c	1.00	.50
Trace mineral premix	.15	.15
Vitamin premix	.25	.25
DL-methionine	.15	.05
L-lysine HCL	.10	.15
Copper sulfate	.075	.075
Total	100	100

^aPhase I diets were fed from d 0 to 14 postweaning, and Phase II diets were fed from d 14 to 28 postweaning.

^bSalt levels of 3.5 and 7 lb/ton were added in place of corn.

^cProvided 150 g/ton of apramycin in Phase I and 50 g/ton of carbodox in Phase II.

Table 2. Effect of Added Salt in Phase II Starter Diets^a

Item	Added salt, lb/ton			CV	Probability, P <	
	0	3.5	7		linear	quadratic
<u>D 0 to 14^b</u>						
ADG, lb	.52	.53	.50	9.5	.62	.46
ADFI, lb	.61	.64	.63	8.5	.56	.57
F/G	1.18	1.19	1.23	5.7	.15	.65
<u>D 14 to 28^c</u>						
ADG, lb	.85	.88	.92	8.9	.12	.94
ADFI, lb	1.35	1.33	1.32	6.4	.66	.93
F/G	1.58	1.52	1.43	8.6	.07	.93
<u>D 0 to 28</u>						
ADG, lb	.68	.71	.71	7.8	.39	.71
ADFI, lb	.98	.98	.97	6.7	.57	.90
F/G	1.43	1.39	1.37	4.7	.13	.83

^aOne hundred seventy-one weanling pigs were used (initially 10.5 lb and 19 +/- 3 d of age) with 10 pigs per pen in three replications and 9 pigs per pen in three replications.

^bAll pigs received a common diet from d 0 to 14 after weaning.

^cDay 14 wt was used as a covariant for d 14 to 28 period.