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Effects of removing vitamin and mineral premixes on growth performance and carcass measurements in finishing pigs

Abstract

Two hundreds sixteen pigs were used to determine the effects of deleting vitamin and mineral premixes on growth performance, carcass characteristics, and integrity of vertebrae in finishing pigs housed in large groups with extreme variation in BW. No negative effects on ADG, ADFI, F/G, carcass characteristics, or integrity of vertebrae occurred when the vitamin and mineral premix was deleted.; Swine Day, Manhattan, KS, November 16, 2000

Keywords

Swine day, 2000; Kansas Agricultural Experiment Station contribution; no. 01-138-S; Report of progress (Kansas State University. Agricultural Experiment Station and Cooperative Extension Service); 858; Swine; Finishing pigs; Vitamins; Minerals

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EFFECTS OF REMOVING VITAMIN AND MINERAL PREMIXES ON GROWTH PERFORMANCE AND CARCASS MEASUREMENTS IN FINISHING PIGS

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Summary

Two hundreds sixteen pigs were used to determine the effects of deleting vitamin and mineral premixes on growth performance, carcass characteristics, and integrity of vertebrae in finishing pigs housed in large groups with extreme variation in BW. No negative effects on ADG, ADFI, F/G, carcass characteristics, or integrity of vertebrae occurred when the vitamin and mineral premix was deleted.

(Key Words: Finishing Pigs, Vitamins, Minerals.)

Introduction

Previous experiments at Kansas State University demonstrated that omitting vitamin and trace mineral premixes from diets in late finishing had no negative effects on growth performance, carcass measurements, or meat quality. However, questions have surfaced about application of this concept in situations of greater stocking densities, larger pen sizes, and less uniform weight within the pens of pigs. Thus, the objective of the experiment reported herein was to determine the effects of omitting vitamin and mineral premixes in late finishing with “commercial-type” housing and management.

Procedures

A total of 256 pigs was sorted from lightest to heaviest, and 216 were chosen and allotted to give the maximum possible body weight variation (average initial wt of 201 lb). There were 27 pigs per pen (6.8 sq ft/pig) with and four pens per treatment. Treatments were corn-soybean meal-based

diets (Table 1) with and without the KSU vitamin and trace mineral premixes. The pigs were housed in a modified open-front building with 50% solid concrete and 50% concrete slat flooring. Each pen (12 ft × 16 ft) had two three-hole self-feeders and a nipple waterer to allow ad libitum consumption of feed and water.

Table 1. Basal Diets^a

Ingredient, %	With Premixes ^b	Without Premixes ^b
Corn	79.58	79.88
Soybean meal (46.5% CP)	17.21	17.16
Soybean oil	1.00	1.00
Lysine HCL	.10	.10
Monocalcium phosphate	.52	.52
Limestone	.85	.85
Salt	.35	.35
KSU vitamin premix	.15	-
KSU trace mineral premix	.10	-
Antibiotic ^c	.12	.12
Total	100.00	100.00

^aAll diets were fed in mash form.

^bFormulated to .80% lysine, .50% Ca, and .45% P.

^cSupplied 100g/ton tylosin.

The pigs were slaughtered when individual pig weight reached approximately 250 lb. The pigs were shipped at 2:00 AM and killed at 7:00 AM at a commercial slaughter plant.

The heaviest half were killed at d 25 of the experiment, and the lightest half were killed on d 32 of the experiment. Last rib backfat thicknesses (measured on the midline of the split carcass) and hot carcass weights were recorded, and dressing percentage (hot carcass weight/final live weight ×100) and fat-free lean (National Pork Producers Council, 2000) were calculated. Also, broken and cracked vertebrae were counted on both sides of the split carcass.

Response criteria were ADG, ADFI, F/G, dressing percentage, last rib backfat thickness, fat-free lean, and integrity of vertebrae. All data were analyzed as a randomized complete block design, and pen was the experimental unit using the GLM procedure of SAS. Also, final variation in pigs weight within each pen was analyzed using Levene's test.

Results and Discussion

Deleting the vitamin and trace mineral premixes did not affect ($P>.47$)ADG, ADFI, F/G, or within-pen variation in final BW (Table. 2). Also, last rib backfat thickness, dressing percentage, fat-free lean, and broken and cracked vertebrae were not affected by the dietary treatments ($P>.11$).

In conclusion, removing the vitamin and mineral premixes did not affect growth performance, within-pen variability in final weight, carcass characteristics, or integrity of vertebrae in pigs fed corn-soybean-based diets from 201 to 257 lb. So, concerns about use of this feeding strategy to lower cost of gain with “commercial-type” stocking densities, pen sizes, and within-pen variation are unfounded.

Table 2. Growth Performance of Pigs Fed Diets with and without the KSU Vitamin and Mineral Premixes from 201 to 257 lb^a

Item	Vitamin & Mineral Premixes		SE	P-Value
	With	Without		
ADG, lb	1.79	1.80	.04	.47
ADFI, lb	6.26	6.16	.10	.77
Feed/gain	3.50	3.42	.09	.51
Residual start wt ^b	8.88	9.62	.47	.31
Residual ending wt ^b	12.62	12.58	.55	.96
Backfat thickness, in	.94	.92	.01	.11
Dressing percentage	73.9	73.8	.2	.72
Fat-free lean, %	52.1	52.3	.1	.27
Pig with a broken vertebrae / pen	6.00	7.50	1.2	.39
Pig with a cracked vertebrae / pen	8.75	8.50	1.4	.90
Broken vertebrae ^c / pen	23.3	19.0	3.7	.45
Cracked vertebrae ^c / pen	12.3	9.8	1.6	.32

^aA total of 216 pigs was used (27 pigs/pen, four pens/trt).

^bLevene's test (absolute value of the differences between the pigs' wt and the pen mean body wt).

^cValue represent the total number of broken(cracked) vertebrae recorded from the 54 sides of pork from each pen.