COMPARISON OF FEED-GRADE ANTIBIOTICS IN STARTER DIETS CONTAINING SPRAY-DRIED BLOOD PRODUCTS[1]

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Summary

A total of 240 pigs (initially 11.6 lb and 19 d of age) was used to compare four different feed-grade antibiotics or antibiotic combinations in phase I (d 0 to 14 postweaning) and phase II (d 14 to 28 postweaning) starter pig diets. Apramycin and carbadox were compared in the phase I diet. Combinations of tylosin/sulfamethazine and neomycin sulfate/oxytetracycline were compared in the phase II diet. No differences occurred in pig performance for the phase I and phase II periods between the feed-grade antibiotics compared in this growth assay. Therefore, determination of appropriate feed-grade antibiotic inclusion will depend on 1) economics, 2) disease profile of the herd, and 3) growth response within a particular producer's herd.

(Key Words: Starter, Performance, Antibiotic.)

Introduction

Numerous growth-promoting antibiotics are available for addition to starter pig diets. Producers are continually faced with the challenge of deciding which feed-grade antibiotics are appropriate for their swine business. This decision often is based on nontechnical information and testimonials rather than research data. Therefore, this trial had three objectives 1) to compare apramycin and carbadox inclusion in phase I (d 0 to 14 postweaning), 2) to compare a tylosin/sulfathiazole combination and a neomycin/oxytetracycline combination in phase II (d 14 to 28 postweaning), and 3) to determine the appropriate sequence of feed grade antibiotic usage in phase I and phase II starter pig diets containing spray-dried blood products.

Procedures

A total of 240 pigs (initially 11.6 lb and 19 d of age) was used in a 28 d growth trial. The trial consisted of two phases. Phase I was from d 0 to 14 postweaning, and phase II was from d 14 to 28 postweaning. Pigs were allotted by weight and placed in 4 ft by 6 ft pens (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 were assigned to one of four treatments based on the sequence of feed-grade antibiotic inclusion. Either 150 g/ton apramycin or 50 g/ton carbadox were included in the phase I diet and a combination of either 100 g/ton tylosin/100 g/ton sulfamethazine (Tylan-sulfa) or 100 g/ton neomycin sulfate/100 g/ton oxytetracycline (Neo-terra) in the phase II diet. Phase I diets were formulated to contain 1.5% lysine, .42% methionine, .9% calcium, and .8% phosphorus. The phase I diets contained 7.5% spray-dried porcine plasma, 1.75% spray-dried blood

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meal, and 20% dried whey. Phase II diets were formulated to contain 1.25% lysine, .34% methionine, .9% calcium, and .8% phosphorus. The phase II diets contained 10% dried whey and 2.5% spray-dried blood meal. Phase I diets were fed in pellet form, and phase II diets were fed in meal form. Pigs and feeders were weighed on d 7, 14, 21, and 28 to evaluate ADG, ADFI, and F/G.

Results and Discussion

No mortality occurred during the 28 d growth period. During phase I, no differences occurred in ADG, ADFI, and F/G between pigs fed apramycin or carbadox (Table 3). Phase I feed-grade antibiotic did not influence phase II performance, and no interactions occurred between feed-grade antibiotic sources fed during phases I and II (Table 5). In addition, no differences occurred in performances between pigs fed tylosin/sulfamethazine or neomycin/oxytetracycline in phase II (Table 4). Because of the similar growth performance, results of this trial indicate that the choice between the feed-grade antibiotics used in this study will depend on economics and risk or perceived risk of tissue residue. In conclusion, this growth assay provides information to swine producers to aid in the selection of feed-grade antibiotics in starter pig diets.

Table 1. Diet Composition

Item	Phase I	Phase II
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	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

Table 2. Feed-Grade Antibiotic Inclusion Levels

Item	Inclusion level, g/ton
Phase I	
Apramycin	150
Carbadox	50
Phase II	
Tylosin/sulfamethazine	100/100
Neomycin sulfate/oxytetracycline	100/100

Table 3. Phase I Performance (d 0 to 14 Postweaning)[ab]

Item	Apramycin	Carbadox	CV
ADG, lb	.57	.57	10.4
ADFI, lb	.64	.63	6.7
F/G	1.13	1.12	6.9

[a]Each value is the mean of 12 pens containing 10 pigs per pen. Pigs were initially 19 d of age and 11.6 lb.
[b]No significant treatment effects.

Table 4. Phase II Performance (d 14 to 28 Postweaning)[ab]

Item	Tylosin/ sulfamethazine	Neomycin sulfate/ oxytetracycline	CV
ADG, lb	.92	.93	8.7
ADFI, lb	1.45	1.44	4.9
F/G	1.58	1.57	6.4

[a]Each value is the mean of twelve pens containing 10 pigs per pen.
[b]No significant treatment effects.

Table 5. Growth Performance d 0 to 28 Postweaning[ab]

	Apramycin		Carbadox		
Item	Tylosin/ Sulfa[c]	Neo/ oxy[d]	Tylosin/ Sulfa	Neo/ oxy	CV
ADG, lb	.91	.90	.94	.96	8.7
ADFI, lb	1.47	1.41	1.43	1.46	4.9
F/G	1.63	1.59	1.53	1.54	6.4

[a]Diets were fed in two phases: Phase I (d 0 to 14 postweaning) and Phase II (d 14 to 28 postweaning). Each value is the mean of six pens containing 10 pigs per pen. Pigs were initially 19 d of age and 11.6 lb.
[b]No significant treatment effects.
[c]Tylosin/sulfamethazine.
[d]Neomycin sulfate/oxytetracycline.