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Evaluation of oral escherichia coli bacterin and water medication on performance of weaned pigs

Abstract

Odd-numbered pigs in new-born litters were vaccinated on d 1 with an oral Escherichia coli bacterin and their performance after weaning was compared with that of nonvaccinated littermates (even numbered pigs). In addition, each group of pigs was allotted to four water medication treatments that were administered from d 2 to d 6 after weaning. No significant interaction between vaccine and water treatment was observed. Vaccinated and non-vaccinated pigs performed similarly throughout the trial for the traits of ADG, ADFI, and F/G, indicating no beneficial effect from vaccination. Water medication after weaning did not affect performance or incidence of scours during the first 14 d. During the next 16 d of the trial, those pigs that had not received water medication grew faster and were 8% more efficient than those that received the Apralan and Genotocin water medications. Overall performance (0 to 30 d) was similar among all water treatments (non-medicated, Apralan, Genotocin, and Neomycin) for the traits of ADG and ADFI. The most efficient pigs were the non-medicated. The incidence of scours was similar for all treatments, except those medicated with Apralan, which had greater incidence.; Swine Day, Manhattan, KS, November 16, 1989

Keywords

Swine day, 1989; Kansas Agricultural Experiment Station contribution; no. 90-163-S; Report of progress (Kansas State University. Agricultural Experiment Station and Cooperative Extension Service); 581; Swine; Weanling pig; E. coli; Water medication

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**EVALUATION OF ORAL *ESCHERICHIA COLI*
BACTERIN AND WATER MEDICATION
ON PERFORMANCE OF WEANED PIGS**

**R. H. Hines, D. A. Schoneweis¹,
R. I. Nicholson, and G. E. Fitzner**

Summary

Odd-numbered pigs in new-born litters were vaccinated on d 1 with an oral *Escherichia coli* bacterin and their performance after weaning was compared with that of nonvaccinated littermates (even numbered pigs). In addition, each group of pigs was allotted to four water medication treatments that were administered from d 2 to d 6 after weaning. No significant interaction between vaccine and water treatment was observed. Vaccinated and non-vaccinated pigs performed similarly throughout the trial for the traits of ADG, ADFI, and F/G, indicating no beneficial effect from vaccination. Water medication after weaning did not affect performance or incidence of scours during the first 14 d. During the next 16 d of the trial, those pigs that had not received water medication grew faster and were 8% more efficient than those that received the Apralan and Genotocin water medications.

Overall performance (0 to 30 d) was similar among all water treatments (non-medicated, Apralan, Genotocin, and Neomycin) for the traits of ADG and ADFI. The most efficient pigs were the non-medicated. The incidence of scours was similar for all treatments, except those medicated with Apralan, which had greater incidence.

(Key Words: Weanling Pig, *E. coli*, Water Medication.)

Introduction

Weaning at 3 to 4 wk of age is very stressful for the young pig and may result in scouring and impaired performance during the 4 weeks after weaning. Many studies have evaluated the effects of nutrition, environment, management, and medication on performance and incidence of scours after weaning. General recommendations for this age of weaning are to feed high nutrient density diets, keep pigs warm (85°F plus) and draft free, sorted into uniform small groups (< 15 head/pen), and medicate feed and/or water as directed by sensitivity tests for *Escherichia coli*.

This study was designed to evaluate the effectiveness of an oral *E. coli* bacterin given on d 1 after birth and four water medications administered from d 2 to d 6 after weaning.

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Experimental Procedures

A total of 192 pigs weaned between 20 and 28 d of age were utilized in a 2 × 4 factorial experiment. Odd numbered pigs in each litter were given an oral *E. coli* bacterin on d 1 after birth and the even numbered pigs remained unvaccinated. At weaning, the odd numbered pigs (vaccinated) were allotted to pens on the basis of weight, sex, and litter and randomly assigned to one of four water treatment pens. The same procedure was utilized to allot even numbered pigs to the four water treatments.

The four water treatments were started on d 2 after weaning and continued through d 6. The four water medications were:

- a) Control – no medication
- b) Apralan – 375 mg/gallon
- c) Genotocin – 25 mg/gallon
- d) Neomycin – 200 mg/gallon

Medication was administered via an in-line water medicator. Four pigs were housed in each 4 × 5 ft pen with woven wire flooring over a Y-flush gutter. Each pen was equipped with a four-hole self feeder and a nipple waterer. Feed and water were provided ad libitum. Pigs and feeders were weighed weekly. The pelleted diet fed was a corn-soybean meal – 20% dried whey – 4% soy oil fortified with minerals and vitamins. Calculated analysis of the experimental diet was 20.2% crude protein, 1.25% lysine, .82% calcium, and .76% phosphorous. The diet was medicated with carbadox (50 g/ton). All pigs received the same diet throughout the 30 d feeding trial.

Pen scour scores were determined daily throughout the trial using the following scoring system:

- (0) Firm, no scours
- (1) Slightly loose
- (2) Loose and watery feces
- (3) Watery feces (very severe).

No pigs were treated individually for scours.

Results and Discussion

Pig health was excellent throughout the 30-d trial. No pigs died or were removed from the trial. No interactions between treatments (vaccine × H₂O treatment) were observed for any of the weigh periods; therefore, only the main comparisons will be reported.

No differences were observed for avg daily gain (ADG), avg daily feed intake (ADFI), or feed efficiency (F/G) between pigs receiving the *E. coli* vaccine and unvaccinated pigs (Table 1). Avg daily scour score favored the vaccinated pigs; however, the difference was non-significant.

Table 1. The Effect of Oral *E. Coli* Bacterin on Performance of Weaned Pigs^a

Item	Vaccinated	Non-Vaccinated
<u>0 - 14 d</u>		
ADG, lb	.42	.40
ADFI, lb	.73	.70
F/G	1.82	1.76
<u>15 - 30 d</u>		
ADG, lb	1.02	1.04
ADFI, lb	1.77	1.82
F/G	1.74	1.76
<u>0 - 30 d</u>		
ADG, lb	.74	.74
ADFI, lb	1.28	1.33
F/G	1.74	1.76
Avg scour score/d	.38	.44

^aA total of 192 weaned pigs, 16 pens/treatment, avg initial wt 14.4 lb, avg final wt 36.7 lb.

Table 2 presents the performance of pigs exposed to various water medications from d 2 to d 6. No differences were observed during the first 14 d after weaning for ADG, ADFI, or F/G. During the next 16 d, the nonmedicated pigs grew significantly faster ($P < .05$) than those pigs that had received the Apralan or Gentocin water medication. All pigs consumed about the same amount of feed per d, resulting in an 8% improvement in feed efficiency for the non-medicated pigs. Performance of pigs water medicated with neomycin was improved in ADG and F/G when compared with those treated with Apralan and Genotocin, but was not significantly different.

The overall performance (0 to 30 d) was similar for all water treatments for the traits of ADG and ADFI. The non-medicated pigs were the most efficient. The incidence of scours was significantly higher in those pigs water medicated with Apralan, with all other water treatments being equal.

Table 2. The Effect of Water Medication from d 2 to d 6 on Performance of Weaned Pigs^a

Item	Non-medicated	Apralan 375 mg/gal	Gentocin 25 mg/gal	Neomycin 200 mg/gal
<u>0 to 14 d</u>				
ADG, lb	.41	.41	.42	.40
ADFI, lb	.69	.71	.75	.71
F/G	1.71	1.84	1.82	1.79
<u>15 to 30 d</u>				
ADG, lb	1.09 ^b	.97 ^c	.99 ^c	1.06 ^{bc}
ADFI, lb	1.79	1.79	1.81	1.79
F/G	1.64 ^b	1.84 ^c	1.85 ^c	1.68 ^{bc}
<u>0 to 30 d</u>				
ADG, lb	.77	.71	.73	.75
ADFI, lb	1.28	1.28	1.31	1.36
F/G	1.65 ^b	1.82 ^c	1.82 ^c	1.71 ^{bc}
Avg scour score/d	.38 ^b	.57 ^c	.36 ^b	.34 ^b

^aA total of 192 pigs, 8 pens/treatment, avg initial wt 14.4 lb, avg final wt 36.7 lb.

^{bc}Means on the same line with different superscripts differ (P<.05).



John Blaske, finishing barn manager.