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## Evaluating oregano oil as a growth enhancer in nursery pig diets

### Abstract

A total of 224 nursery pigs (PIC L 327L – C22) initially  $12.9 \pm 3.0$  lb and 21 d of age were used in a 28-d feeding trial. The objective of our study was to evaluate the effects of oregano oil, with or without an in-feed antimicrobial. Oregano oil is a plant extract derived from the Greek herb, *Origanum vulgare*. It has been speculated to have antimicrobial-like activity. There were four dietary treatments in a 2 × 2 factorial. Diets consisted of a negative control (without an antibiotic or oregano oil), the control diet plus neomycin/oxytetracycline (140 g/ton), the control diet plus oregano oil, or the control diet with both neomycin/ oxytetracycline and oregano oil. The oregano oil (5%) was added to an inert carrier (95%) to make a premix that was added to the diet at 2 lb/ton in phase 1 (d 0 to 14) and 1 lb/ton in phase 2 (d 14 to 28). During the 28-d trial, neomycin/oxytetracycline improved ADG, ADFI and F/G. Pigs fed dietary treatments containing neomycin/oxytetracycline had the heaviest average weights at the end of the trial. Adding oregano oil to nursery pig diets did not improve ADG, ADFI, or F/G during the 28-d trial.; Swine Day, 2004, Kansas State University, Manhattan, KS, 2004

### Keywords

Swine day, 2004; Report of progress (Kansas State University. Agricultural Experiment Station and Cooperative Extension Service); 940; Kansas Agricultural Experiment Station contribution ; no. 05-113-S; Nursery pigs; Neomycin/Oxytetracycline; Swine; Oregano; Pigs

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## EVALUATING OREGANO OIL AS A GROWTH ENHANCER IN NURSERY PIG DIETS

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### Summary

A total of 224 nursery pigs (PIC L 327L × C22) initially  $12.9 \pm 3.0$  lb and 21 d of age were used in a 28-d feeding trial. The objective of our study was to evaluate the effects of oregano oil, with or without an in-feed antimicrobial. Oregano oil is a plant extract derived from the Greek herb, *Origanum vulgare*. It has been speculated to have antimicrobial-like activity. There were four dietary treatments in a  $2 \times 2$  factorial. Diets consisted of a negative control (without an antibiotic or oregano oil), the control diet plus neomycin/oxytetracycline (140 g/ton), the control diet plus oregano oil, or the control diet with both neomycin/oxytetracycline and oregano oil. The oregano oil (5%) was added to an inert carrier (95%) to make a premix that was added to the diet at 2 lb/ton in phase 1 (d 0 to 14) and 1 lb/ton in phase 2 (d 14 to 28). During the 28-d trial, neomycin/oxytetracycline improved ADG, ADFI and F/G. Pigs fed dietary treatments containing neomycin/oxytetracycline had the heaviest average weights at the end of the trial. Adding oregano oil to nursery pig diets did not improve ADG, ADFI, or F/G during the 28-d trial.

(Key Words: Nursery Pigs, Neomycin/Oxytetracycline, Oregano, Pigs.)

### Introduction

Finding and evaluating new feed additives and substitutes for antibiotics is an ongoing task in the swine industry. Several ingredients have been proposed to partly or fully replace antibiotics in swine diets, such as milk products, spray-dried animal plasma, zinc oxide, copper sulfate, diet acidifiers, egg immunoglobulins, mannan oligosaccharide, probiotics, fructo-oligosaccharide, spices, botanicals, essential oils, and herbs. Oregano oil is a plant extract derived from the Greek herb, *Origanum vulgare*. It has been shown to have antimicrobial-like activity. This makes oregano a natural feed additive with the potential to enhance palatability of swine feed and to improve ADG and F/G in pigs. Therefore, the objective of this trial was to compare the effects of oregano oil and the in-feed antimicrobial combination of neomycin/oxytetracycline on growth performance in nursery pigs.

### Procedures

A total of 224 weanling pigs with an initial average weight of 12.8 pounds (PIC L 327L × C22) were blocked by weight and randomly allotted to one of four dietary treatments. The dietary treatments were arranged in a  $2 \times 2$  factorial. Pigs were fed a negative-control diet (without in-feed antimicrobials or oregano

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<sup>1</sup>The authors thank Ralco-mix Products, Inc., Marshall, MN, for supplying the oregano oil used in this study.

oil), the control diet with neomycin (140 g/ton) and oxytetracycline (140 g/ton), the control diet with oregano oil, and the control diet with both neomycin/oxytetracycline and oregano oil. Oregano oil premix was added at 2 lb/ton in phase 1 and 1 lb/ton in phase 2.

There were seven pigs per pen and eight pens per treatment. Pigs were housed at the Kansas State University Swine Teaching and Research Center's environmentally controlled nursery, with one self feeder and one nipple waterer in each pen to allow ad libitum access to feed and water. The experimental diets were fed in a meal form and in two phases. The phase 1 diet (Table 1) was fed from d 0 to 14, and the phase 2 diet was fed from d 14 to 28. Pigs were weighed on d 0, 7, 14, 21 and 28 to determine ADG, ADFI, and F/G. Data were analyzed as a factorial arrangement, with main effects of neomycin/oxytetracycline and oregano oil in a randomized complete-block design.

## Results and Discussion

There were no neomycin/oxytetracycline by oregano oil interactions observed (Table 2). Adding oregano did not improve growth performance from d 0 to 14 or overall (d 0 to 28), but ADG, ADFI, and F/G were improved ( $P < 0.01$ ) for the pigs fed neomycin/oxytetracycline in both the d 0 to 14 and d 0 to 28 periods. Pigs fed neomycin/oxytetracycline were also the heaviest ( $P < 0.01$ ) at the end of the trial. Oregano oil was not effective in enhancing growth performance in this experiment.

**Table 1. Diet Composition (As-fed Basis)**

Item	Phase 1 <sup>a</sup>	Phase 2
Ingredient, %		
Corn	48.10	59.97
Soybean meal (46.5% CP)	29.00	34.98
Spray dried whey	15.00	---
Select menhaden fish meal	3.75	---
Monocalcium phosphate (21% P)	1.15	1.60
Limestone	0.70	1.10
Salt	0.33	0.35
Vitamin premix with phytase	0.25	0.25
Trace mineral premix	0.15	0.15
L-Threonine	0.13	0.15
L-Lysine HCl	0.30	0.30
DL-Methionine	0.15	0.15
Corn starch <sup>b</sup>	1.00	1.00
Calculated Analysis		
Lysine, %	1.55	1.45
Isoleucine:lysine ratio, %	74	64
Leucine:lysine ratio, %	146	129
Methionine:lysine ratio, %	40	33
Methionine&Cystine: lysine ratio, %	69	59
Threonine;lysine ratio, %	79	65
Tryptophan:lysine ratio, %	21	18
Valine:lysine ratio, %	82	71
ME, kcal/lb	1,478	1,506
Crude protein, %	26.4	21.4
Ca, %	1.09	0.85
Available P, %	0.63	0.42

<sup>a</sup>Phase 1 diets were fed in meal form from d 0 to 14 after weaning. Phase 2 diets were fed in meal form from d 14 to 28 after weaning.

<sup>b</sup>Oregano oil premix (2 lb/ton in phase 1 and 1 lb/ton in phase 2) or neomycin/oxytetracycline (140 g/ton) was added at the expense of corn starch to provide the experimental diets.

**Table 2. Growth Performance Effects of Feeding Oregano Oil Post-Weaning<sup>ab</sup>**

Item	Negative Control	Neomycin/ oxytetracycline	Oregano Oil	Oregano oil and Neomycin/ oxytetracycline	SE	P-Value		
						Oregano Oil	Neomycin/ oxytetracycline	Neomycin/ Oxytetracycline X Oregano Oil
Initial Weight, lb	12.86	12.92	12.89	12.84	1.17	0.80	0.88	0.57
Day 0 to 14								
ADG, lb	0.50	0.63	0.52	0.62	0.03	0.67	0.0001	0.40
ADFI, lb	0.59	0.67	0.60	0.66	0.03	0.87	0.0001	0.61
F/G	1.19	1.07	1.16	1.08	0.02	0.52	0.0001	0.39
Day 0 to 28								
ADG, lb	0.78	0.93	0.81	0.92	0.03	0.61	0.0001	0.25
ADFI, lb	1.05	1.20	1.07	1.19	0.05	0.98	0.0001	0.54
F/G	1.35	1.29	1.31	1.29	0.02	0.24	0.01	0.15
Final Weight. lb	34.70	39.03	35.67	38.59	1.86	0.65	0.0001	0.22

<sup>a</sup>A total of 224 nursery pigs with seven pigs/pen with eight pens/treatment were used.

<sup>b</sup>Oregano oil premix was added at 2 lb/ton from d 0 to 14 and 1 lb/ton from d 14 to 28. Neomycin/oxytetracycline was added at 140g/ton.