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Editors
W. Christopher Scruton
Stephen Claas

Layout
David Brown

Cover Design
Ruth Cronje, and Jan Swanson;
based on the original design by Dr. Robert Dunlop

Evaluation of the recrudescence of *Actinobacillus pleuropneumonia* following Pulmotil treatments in nursery and grower pigs

D. P. Bane[1], L. K. Clark[2], K. E. Knox[2], C. C. Wu[3], and L.E. Watkins[1]
[1]Elanco Animal Health, and Purdue University Departments of [2]Veterinary Clinical Sciences and [3]Veterinary Pathobiology

INTRODUCTION

Pulmotil is effective at preventing clinical outbreaks of respiratory disease caused by *Actinobacillus pleuropneumonia* (App) and *Pasteurella multocida* (Pm) when fed at 200 - 400 ppm. Dose determination studies with Pulmotil indicated that App could not be isolated from lungs of pigs following a 21 day treatment with 300 or 400 ppm Pulmotil. We investigated the potential for recrudescence of App at 3 and 5 weeks following the end of Pulmotil treatment at 400 ppm for 21 days in nursery and growing pigs.

MATERIALS AND METHODS

Approximately 120, 16 day old pigs were selected and identified from a commercial swine herd that was endemically infected with App serotype 1. Two, on-farm Pulmotil treatments were tested (0 ppm and 400 ppm) in nursery and growing pigs. Diets containing 400 ppm Pulmotil were fed immediately postweaning for 21 days to a selected group of nursery pigs, and later, to a different group of growing pigs for 21 days (beginning at 11 weeks of age). Similar, non-medicated diets were fed to the control pens of pigs in the nursery and grower rooms. All pigs received non-medicated diets after the initial, on-farm medication period. At the end of the Pulmotil medication periods, 24 Pulmotil-medicated and 24 non-medicated nursery and grower pigs were selected and transported to a disease isolation facility. Disease isolation rooms were used for this experiment to prevent horizontal disease transmission among test groups after Pulmotil treatment. Dexamethasone injections (10 mg/kg or 0 mg/kg for 2 consecutive days) were used at 14 days after placement into disease isolation facilities to enhance clinical expression of disease after Pulmotil treatment. All pigs were weighed and randomly allocated to dexamethasone treatment on arrival at the disease isolation facility. Clinical impression scores were compiled daily for all pigs. Serum antibodies for App 1 were assayed from samples collected from each pig as they entered the disease isolation facilities and at necropsy. Randomly selected pigs were weighed and necropsied at 3 and 5 weeks after the end of Pulmotil feeding to record lung lesions and to determine infection with App. Nasal swabs, tonsil swabs and lung parenchyma from each pig were cultured for App 1.

RESULTS

The trial results are indicated in Tables 1 and 2. The Pulmotil-treated nursery pigs gained significantly more than non-treated pigs (0.84 vs. 0.57 pounds per day, $P < 0.0007$) during the 3 or 5 weeks following the Pulmotil treatment period. The pigs treated with Pulmotil from 11 to 14 weeks of age were heavier than their untreated contemporaries ($P < 0.0001$) at entry to the isolation facilities The Pulmotil-treated grower pigs gained significantly more than non-treated pigs (0.62 vs. 0.50 pounds per day, $P < 0.004$) during the 3 or 5 weeks following the Pulmotil treatment period. These results indicated that Pulmotil not only increased growth during the period of treatment, but also maintained that growth differential 3 and 5 weeks after it was removed from the feed. An effect of dexamethasone on clinical disease or on growth rate in the pigs was not observed.

The clinical impression scores were significantly improved by Pulmotil in nursery pigs ($P < 0.0001$) (Table 1) and grower pigs ($P < 0.002$) (Table 2).

All Pulmotil-treated nursery pigs were seronegative to App 1 on entry to the disease isolation facilities and at necropsy (Table 1). Two non-treated pigs were seropositive to App

at necropsy. All Pulmotil-treated grower pigs were seronegative to App 1 at entry to the disease isolation facilities, but most (21 of 24) of the non-treated grower pigs were seropositive to App 1 (Table 2). At necropsy, some of the Pulmotil-treated pigs had seroconverted to App 1.

App 1 was not isolated from the tissues of any of the Pulmotil-treated nursery pigs, but was isolated from tissues of 2 pigs in the untreated nursery group. In the grower pigs, App 1 was not isolated from tissues of any pigs at necropsy even though many pigs were seropositive to this organism.

The mean lung lesion scores of nursery pigs did not differ between treatments. In grower pigs, mean lung lesion scores were lower in the Pulmotil-treated than in the non-treated pigs (14.7 to 8.7, P <0.07).

SUMMARY

- Seroconversion to and isolation of App serotype 1 did not occur in 58 and 72 day old pigs fed Pulmotil at 400 ppm from 16 to 37 days of age. Both seroconversion to App 1 and isolation of App 1 occurred in non-medicated cohort pigs.
- Pulmotil fed at 400 ppm for the first 3 weeks after weaning significantly improved the performance of pigs after Pulmotil was withdrawn from the feed.
- Pulmotil fed at 400 ppm from 11 to 14 weeks in the grower diets significantly improved the performance of pigs during the medication period, and after Pulmotil was withdrawn from the feed.
- Pulmotil fed at 400 ppm from 11 to 14 weeks in the grower diets significantly improved lung lesions in pigs in pigs necropsied at 17 and 19 weeks of age.

Table 1 -- The effect of 400 ppm Pulmotil for 21 days in 16 day old nursery pigs

			Control	*(P<)*	*Pulmotil*
Weight(lbs.)	Entry		20.03	(.9)	20.2
	ADG(lbs.)*		.57	(.0007)	.84
Clinical Scores	(+/all)		127/1288	(.0001)	17/1288
Serology	App +/-	Entry	2/22	(.5)	0/24
		Necropsy	2/22	(.5)	0/24
Bacteriology	APP +/all		2/24	(.49)	0/24
Lung Scores			7.3	(.5)	10.0

- Average daily gain from 37 days of age to 58 or 72 days of age.

Table 2 -- The effect of 400 ppm Pulmotil for 21 days in 11 week old grower pigs					
			Control	*(P=)*	*Pulmotil*
Weight(lbs.)	Entry		49.3	(.0001)	65.9
	ADG(lbs.)*		50	(.004)	.62
Clinical scores	+/all		33/1008	(.0014)	11/1008
Serology	App +/-	Entry	21/3	(.0001)	0/24
		Necropsy	18/6	(.0001)	5/19
Bacteriology	APP +/all		0/24	NA	0/24
Lung scores			14.7	(.07)	8.7

*Average daily gain from 14 weeks of age to 17 or 19 weeks of age.