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## EFFECT OF VARIOUS ANTHELMINTICS ON

## GROWING-FINISHING

## SWINE REARED ON DIRT LOTS

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## Summary

Two trials involving 262 pigs were conducted to evaluate five worming programs for growing-finishing pigs fed on dirt lots heavily infected with roundworm (Ascarid) eggs. The control pigs (no anthelmintic) were compared in performance (ADG, F/G) and lung liver lesions at slaughter with pigs that received ivermectin on day 1 or day 28, pyrantel tartrate for the first 28 days, or purge treatments between day 28 to 31 with dichlorvos or fenbendazole. All pigs gained at a similar rate regardless of treatment; however, those pigs receiving fenbendazole were 8.4% more efficient and those receiving Ivermectin on day 28 were 6% more efficient when compared to the controls. Pigs receiving pyrantel tartrate, dichlorvos, and ivermectin on day 1 were similar to the control pigs in feed efficiency. Results for liver and lung lesion scores were varied. In trial 1, 12% of the livers were free of ascarid scars and 13.8% of the livers were ruled inedible. In trial 2, 23.3% of the livers showed no lesions, but a different U.S.D.A. inspector condemned 54.4% of the livers even though the average liver lesion scores were similar to those in trial 1.

## Introduction

Several new anthelmintics have become available during the past few years for use by swine producers. Therefore, the objective of this study was to compare various programs for effectiveness in reducing liver and lung damage from ascarid infestation. In addition, performance traits of ADG and F/G were compared for pasture-reared, growing finishing pigs.

## Procedures

Trial 1. One hundred and thirty-two crossbred pigs (D-CW-Y) weighing approximately 62 lb were allotted by weight, sex, and ancestry to 6 treatments. Treatments were as follows:

- A. Control - no anthelmintic
- B. Ivermectin-1 (Ivomec) - pigs were given 1 cc of Ivomec the day they were moved from a controlled environmental nursery to the dirt lots.
- C. Ivermectin-28 (Ivomec) - pigs were given 1 1/2 cc of Ivomec on day 28 of the trial.
- D. Pyrantel tartrate - (Banminth) was fed for the first 28 days after pigs were placed in the dirt lots.
- E. Dichlorvos - (Atgard) was fed from day 28 to 31.
- F. Fenbendazole - (Safeguard) was fed from day 28 to 31.

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Hogs have been continuously fed for the past several years in the dirt lots utilized in the study. Roundworm (Ascarid) eggs are prevalent in the lots. Each lot is equipped with one nipple waterer, a 10 hole self feeder, and an 8' x 16' mono-slope portable shed. The shed sits on a concrete slab with mister nozzles within the shed to cool the pigs. The feeder and nipple waterer are located on another concrete slab, and the remainder of the 50 x 150 lot is dirt with no vegetation.

Two pigs (smallest barrow and gilt) were removed from each pen at 28 days for slaughter to determine ascarid damage to the liver and lungs.

At the termination of the trial, several of the finished pigs (all the barrows and a few gilts) were taken to a slaughter plant to score the liver and lungs for ascarid damage.

The liver and lungs were scored using the following system:

- Liver scores:
- (1) No ascarid scars
  - (2) few scars <25
  - (3) moderate scars + 100
  - (4) heavy scars >150
- Lung scores:
- (1) No lesions
  - (2) Consolidation adhesions and/or abscesses involving <10% lung tissue
  - (3) Consolidation adhesions and/or abscesses involving 10-20% lung tissue
  - (4) Consolidation adhesions and/or abscesses involving 20-30% lung tissue

Pigs were fed a milo-soybean meal fortified diet in meal form. The diet contained 15.7% crude protein, .75% lysine, .75% calcium, and .65% phosphorus.

Trial 2. Trial 2 was identical to Trial 1 except it was conducted during the late summer-fall (September 5 to December 15, 1986). The 132 pigs used in this trial averaged 66 lb initially and were fed in the same lots used for Trial 1.

## Results

In Trial 1, pigs from the control pen, after 28 days, showed no evidence of lung damage, but the livers had approximately 150 ascarid scars. The Banminth-treated pigs showed no evidence of lung lesions or liver scars. Those pigs receiving Ivomec on day 1 had no evidence of lung damage and only 2-7 ascarid scars on the liver. In Trial 2, the Banminth-treated pigs were again free of lung lesions and liver scars. The control pigs had approximately 100 liver scars, and the Ivomec-1 pigs showed approximately 20-25 liver scars. These data certainly reflect the effectiveness of Banminth fed continuously for control of larvae in the roundworm cycle.

Each of the feeding trials was approximately 100 days in duration. No differences were observed in average daily gain from treatment. Average daily feed intake was significantly lower for the pigs receiving the Safeguard treatment when compared with the control pigs, pigs treated on day 1 with Ivomec, pigs fed

Banminth for 28 days, and the pigs treated with Atgard. Daily feed intake was not significantly different from that of pigs given Ivomec on day 28 and the pigs receiving Safeguard. Since rate of gain was similar for all treatments, feed/gain ratios followed a pattern similar to that of average daily feed intake. Pigs dewormed with Safeguard were 8.4% more efficient than the control pigs, and those injected with Ivomec at 28 days was 6.0% more efficient than the controls. All other treatments were similar in feed/gain ratios.

Table 3 presents the average liver and lung scores, as well as the number of livers without roundworm scars and number that were condemned by the USDA inspector. Control pigs in Trial 1 showed the greatest ascarid damage and the Banminth-treated pigs had the least. Livers condemned in this trial represented only 13.8% of the total whereas in Trial 2 the inspector condemned 54.4% of the livers. The USDA inspectors were different for each of the trials, which may explain the disparity, since the liver scores did not differ greatly. However, in contrast with trial 1, those pigs fed Banminth for the first 28 days showed the greatest degree of liver scars in trial 2.

Lung lesions were absent in Trial 1; however, in Trial 2 a low incidence of lesions did occur.

Table 1. Performance of Finishing Pigs Administered Various Anthelmintics

Item	Control	IVO-1 <sup>f</sup>	IVO-28 <sup>f</sup>	Banminth	Safeguard	Atgard
<u>Avg. da. gain, lb</u>						
Trial 1 <sup>d</sup>	1.71	1.68	1.71	1.69	1.72	1.66
Trial 2 <sup>e</sup>	<u>1.76</u>	<u>1.73</u>	<u>1.74</u>	<u>1.75</u>	<u>1.72</u>	<u>1.79</u>
	1.74	1.70	1.72	1.72	1.72	1.72
<u>Avg. da. feed, lb</u>						
Trial 1	6.43	6.03	5.98	5.95	5.79	5.99
Trial 2	<u>6.96</u>	<u>6.98</u>	<u>6.61</u>	<u>7.16</u>	<u>6.49</u>	<u>6.95</u>
	6.70 <sup>a</sup>	6.50 <sup>ab</sup>	6.30 <sup>bc</sup>	6.56 <sup>ab</sup>	6.14 <sup>c</sup>	6.47 <sup>ab</sup>
<u>Feed/gain</u>						
Trial 1	3.76	3.59	3.49	3.52	3.36	3.62
Trial 2	<u>3.96</u>	<u>4.03</u>	<u>3.80</u>	<u>4.08</u>	<u>3.77</u>	<u>3.88</u>
	3.86 <sup>a</sup>	3.81 <sup>ab</sup>	3.64 <sup>bc</sup>	3.80 <sup>ab</sup>	3.56 <sup>c</sup>	3.75 <sup>ab</sup>

<sup>abc</sup> Means in the same line with different superscripts are different (P<.10).

<sup>d</sup> Average initial weight 62 lb, final weight 232 lb, 20 pigs/pen.

<sup>e</sup> Average initial weight 66 lb, final weight 245 lb, 20 pigs/pen.

<sup>f</sup> Ivermectin injected on d 1 or d 28.

Table 2. Effect of Various Anthelmintics on Ascarid Damage of Liver and Lung Tissue

Item <sup>i</sup>	Control	IVO-1 <sup>d</sup>	IVO-28 <sup>d</sup>	Banminth	Safeguard	Atgard
<u>Trial 1<sup>a</sup></u>						
No. pigs eval.	12	11	11	11	9	11
Liver score <sup>b</sup>	3.83	2.63	2.20	1.90	2.40	3.00
Lung score <sup>c</sup>	1.00	1.00	1.00	1.00	1.00	1.00
No. livers w/o scars	0	0	2	2	3	1
No. livers condemned	4	0	0	1	2	2
<u>Trial 2<sup>a</sup></u>						
No. pigs eval.	15	15	15	15	15	15
Liver score <sup>b</sup>	2.80	2.80	2.26	3.67	2.80	2.33
Lung score <sup>c</sup>	1.40	1.40	1.80	1.33	1.80	1.53
No. livers w/o scars	4	2	6	0	3	6
No. livers condemned	8	8	5	15	7	6

<sup>a</sup> Trial 1 was conducted in the spring (5/14/86-8/20/86); Trial 2 was conducted in the fall (9/15/86-12/15/86).

<sup>b</sup> Liver scoring system = 1=no scars, 2=few scars, 3=moderate scars, 4=heavy scars.

<sup>c</sup> Lung scoring system = 1=no lesions, 2=<10% lesions, 3=10-20% lesions, 4=more than 20% lesions.

<sup>d</sup> Ivermectin injected on da 1 or d 28.



Joe Carpenter, research assistant, builds new pens for the gilt pool.