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Chlortetracycline and Arsanilic Acid Combinations in Diets of
Growing-Finishing Swine

George W. Libal, Steven L. Robbins and Richard C. Wahlstrom

The antibiotic chlortetracycline (aureomycin) and the arsenical compound arsanilic acid have both been shown to improve performance of growing-finishing pigs in previous research. In most experiments, the greatest benefits from feed additives of this type have been during the early growth period. Since these two feed additives are of different types, it is thought that they might be more effective when combined than feeding either one alone.

This experiment was conducted to evaluate the growth rate and feed efficiency of pigs from weaning to market weight when fed diets containing various combinations of chlortetracycline and arsanilic acid.

Experimental Procedure

One hundred forty-seven crossbred pigs were used. The pigs were allotted to seven experimental treatments in three replicates on the basis of sex, ancestry and weight. The three replications were started on test at different times to equalize average pen starting weight and minimize variation within each pen. Each pen consisted of four gilts and three barrows. The average starting weight of all pigs was 32 pounds.

The pigs were housed 7 pigs per pen in a slatted floor, totally enclosed confinement building. Pens were 7.5 feet by 9 feet. A 3-hole self-feeder and nipple type waterer were located in each pen.

Three basal diets were used. A 17% protein diet was fed the first 6 weeks, a 15% protein diet the next 6 weeks and a 13% protein diet for the last 4 weeks of the 16-week experiment. The composition of the basal diets is shown in table 1. The chlortetracycline and arsanilic acid levels included in the diets for the seven treatments were as follows:

<u>Treatment</u>	<u>Gm/ton</u>	
	<u>Chlortetracycline</u>	<u>Arsanilic acid</u>
1	0	0
2	50	0
3	50	22.5
4	25	45
5	50	45
6	50	90
7	0	90

Results

Growth performance data are summarized in table 2. The results are presented for each of three periods, first 6 weeks, second 6 weeks and last 4 weeks and also the accumulative results at 12 and 16 weeks. No statistically significant differences were found for average daily gain, daily feed consumption or feed/gain. Only pig weights at the end of the 12-week period were found to be statistically different.

All treatment groups did gain slightly faster than the unsupplemented controls during the first 6 weeks. Daily gains ranged from 1.15 lb. for pigs not receiving any feed additive to 1.29 lb. for those pigs fed diets containing 50 gm of chlortetracycline and 45 gm of arsanilic acid per ton of feed. These results are similar to many others that have shown the greatest response to feed additives occurs during the early growth period. During the second 6-week period, gain of pigs fed the control diet was intermediate to that of the various supplemented groups as three supplemented treatment groups gained faster and three supplemented treatment groups gained slower than the controls. Pigs fed the control diet gained faster than those fed supplemented diets during the last 4 weeks of the trial. Thus, differences in gain among treatments were small when averaged over the complete 16-week period.

There did not appear to be any particular trends in feed consumption and feed/gain. Pigs fed the unsupplemented control diet were quite efficient requiring only 3.15 lb. of feed per lb. of gain. Only the pigs receiving the diet supplemented with 90 gm per ton of arsanilic acid were more efficient. These pigs had a feed efficiency of 3.02 or 4% less than the control pigs.

Summary

A 16-week study was conducted using 147 weanling pigs to evaluate different levels and combinations of chlortetracycline and arsanilic acid in growing-finishing swine diets. In this experiment there were no significant effects on daily gain or feed/gain from any of the combinations used.

Table 1. Composition of Basal Diets, %

Ration ingredient	Protein levels		
	17% 6 weeks	15% 6-12 weeks	13% 12-16 weeks
Ground yellow corn	59.75	81.25	86.80
Soybean meal, 50%	22.00	15.50	10.50
Ground oats	15.00	---	---
Calcium carbonate	0.50	0.75	0.70
Dicalcium phosphate	2.00	1.75	1.25
Trace mineralized salt	0.50	0.50	0.50
Vitamin premix ^a	0.25	0.25	0.25

^a Provided per lb. of diet: vitamin A, 1500 IU; vitamin D, 150 IU; riboflavin, 1.25 mg; pantothenic acid, 5 mg; niacin, 10 mg; choline, 50 mg and vitamin B₁₂, 7.5 micrograms.

Table 2. Summary of Growth and Feed Data by Treatment

	<u>Treatments, gm/ton</u>						
	0	0	22.5	45	45	90	90
Arsanilic acid	0	0	22.5	45	45	90	90
Chlortetracycline	0	50	50	25	50	50	0
		<u>Pig weights, lb.</u>					
Initial	32.3	32.2	32.2	32.5	32.3	32.3	32.5
6 wks	80.6	81.8	83.2	81.3	86.6	83.8	84.0
12 wks ^a	148.9	146.4	154.5	148.2	157.6	151.9	154.3
16 wks	200.8	194.1	203.7	198.5	205.8	202.8	203.5
		<u>Average daily gain, lb.</u>					
0-6 wks	1.15	1.18	1.21	1.16	1.29	1.22	1.23
6-12 wks	1.63	1.53	1.70	1.59	1.69	1.61	1.68
0-12 wks	1.39	1.36	1.46	1.38	1.49	1.43	1.45
12-16 wks	1.86	1.70	1.76	1.80	1.72	1.82	1.76
0-16 wks	1.51	1.44	1.53	1.48	1.55	1.52	1.53
		<u>Daily feed consumption, lb.</u>					
0-6 wks	3.03	3.26	3.39	3.18	3.30	3.39	3.07
6-12 wks	5.19	5.17	5.44	5.04	5.44	5.21	5.46
0-12 wks	4.11	4.22	4.47	4.11	4.37	4.30	4.15
12-16 wks	6.53	6.48	6.50	6.66	6.37	6.43	6.13
0-16 wks	4.72	4.78	4.94	4.75	4.87	4.83	4.64
		<u>Feed/gain</u>					
0-6 wks	2.65	2.78	2.80	2.77	2.56	2.77	2.51
6-12 wks	3.22	3.40	3.21	3.20	3.23	3.22	3.28
0-12 wks	2.98	3.13	3.04	3.02	2.94	3.03	2.88
12-16 wks	3.57	3.85	3.75	3.74	3.74	3.56	3.50
0-16 wks	3.15	3.34	3.24	3.24	3.16	3.19	3.02

^aSignificant difference due to treatment (P<.05).