

1959

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Recommended Citation

Wahlstrom, Richard C. and Juhl, Elson W., "Feed Additives in Starter Rations for Pigs Weaned" (1959). *South Dakota Swine Field Day Proceedings and Research Reports, 1959*. Paper 4.
http://openprairie.sdstate.edu/sd_swine_1959/4

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Feed Additives in Starter Rations for Pigs Weaned
at Four Weeks of Age ^{1/}

Richard C. Wahlstrom and Eldon W. Juhl

During the past year several new feed additives have appeared to give benefits equal to or superior to other recognized additives. Since pigs are being weaned at younger ages it seemed desirable to obtain information on the value of several additives in pig starter rations fed to pigs four to eight weeks of age.

Experimental Plan

Three separate trials are reported. Trial 1 was conducted in the Fall of 1958 using 72 purebred Duroc, Hampshire, Poland China and Spotted Poland China pigs. These pigs averaged approximately 17 pounds when allotted into 12 lots of six pigs each. Two lots of pigs received each ration treatment for the four week period. Trials 2 and 3 were conducted during the Spring of 1959. Ninety-six four-week old pigs were allotted to each of these trials. Again there were two lots of pigs receiving each of the six treatments. Eight pigs were allotted per lot. A complete mixed ration was fed in concrete lots in all trials. The basal ration fed in all trials is shown in table 1.

Table 1. Composition of Basal Ration (percent)

Ground yellow corn	58.1
Soybean oilmeal	14.2
Dried skimmilk	11.4
Sugar	10.0
Tankage	5.0
Di-calcium phosphate	0.7
Trace mineral salt	0.5
B-vitamin supplement*	0.1

* Furnished 2 mg. riboflavin, 4 mg. pantothenic acid, 9 mg. niacin, 10 mg. choline and 10 mcg. vitamin B₁₂ per lb. of ration.

Summary of Results

A complete summary of the results of the three trials is given in tables 2, 3 and 4.

^{1/} Presented at South Dakota State College Swine Field Day, August 28, 1959.

Table 2. (Trial 1) Erythromycin in Starter Rations for Pigs 4 to 8 Weeks of Age.

Antibiotic	Lot 1	Lot 2	Lot 3	Lot 4	Lot 5	Lot 6
	None	Erythro- mycin	Erythro- mycin	Erythro- mycin	Erythro- mycin	Aureo- mycin
Grams per ton	None	5	10	25	50	100
No. of pigs ^{a/}	12	12	12	12	12	12
Av. initial wt., lb.	16.9	17.0	17.0	16.9	16.9	16.9
Av. final wt., lb.	31.8	36.0	35.4	34.0	36.1	37.0
Av. daily gain, lb.						
Rep. I	0.49	0.75	0.68	0.56	0.72	0.79
Rep. II	0.58	0.61	0.64	0.65	0.65	0.64
Ave.	0.53	0.68	0.66	0.60	0.68 ^{b/}	0.72 ^{b/}
Feed/pig/day, lb.	1.32	1.38	1.26	1.20	1.22	1.51
Feed/lb. gain, lb.	2.46	2.02	1.91	1.98	1.78	2.11

^{a/} Two replicated lots of six pigs each per treatment.

^{b/} Significantly greater than Lot 1 (5% level).

erythromycin had

Pigs fed a ration containing 5, 10, 25 or 50 gms. per ton of an average gain from 13.2 to 28.3 percent faster than the pigs fed the basal ration. Some variation existed between the replicate lots but in all cases the erythromycin fed pigs gained at the faster rate. Aureomycin fed at a level of 100 grams per ton produced a 35.8 percent increase in average daily gain.

Improved feed efficiency in the erythromycin lots averaged from 17.9 to 27.6 percent. The 50 gram level of erythromycin gave the greatest improvement and the 5 gram level the least. Pigs fed aureomycin had a 14.2 percent improvement in feed efficiency as compared to the control pigs.

Table 3. (Trial 2) Antibiotics in Starter Rations for Pigs From 4 to 8 Weeks of Age.

Antibiotic	Lot 1	Lot 2	Lot 3	Lot 4	Lot 5	Lot 6
	None	Aureo- mycin	Erythro- mycin	Aureomycin and Erythromycin	SPS ^{a/}	SPS ^{a/}
Grams per ton	None	50	10	50 and 10	50	100
No. of pigs ^{b/}	15	15	14	14	14	13
Av. initial wt., lb.	16.3	16.4	15.9	16.4	16.6	16.8
Av. final wt., lb.	28.3	29.8	30.9	30.8	33.6	34.4
Av. daily gain, lb.						
Rep I	0.51	0.56	0.63	0.58	0.66	0.66
Rep II	0.33	0.38	0.48	0.42	0.53	0.58
Ave.	0.43	0.48	0.55	0.51	0.60 ^{c/}	0.63 ^{c/}
Feed/pig/day, lb.	0.88	0.83	1.09	1.01	0.91	0.98
Feed/lb. gain, lb.	2.05	1.73	1.98	1.99	1.52	1.56

^{a/} Streptomycin 41.8%, Penicillin 16.4%, Sulfaquinoxaline 41.8%.

^{b/} Eight pigs were allotted in replicate I and 7 in replicate II. One pig died in each of lots 3, 4 and 5 and two pigs died in Lot 6.

^{c/} Significantly greater than Lot 1, (1% level).

Table 2. (Trial 1) Erythromycin in Starter Rations for Pigs 4 to 8 Weeks of Age.

Antibiotic	Lot 1	Lot 2	Lot 3	Lot 4	Lot 5	Lot 6
	None	Erythro- mycin	Erythro- mycin	Erythro- mycin	Erythro- mycin	Aureo- mycin
Grams per ton	None	5	10	25	50	100
No. of pigs ^{a/}	12	12	12	12	12	12
Av. initial wt., lb.	16.9	17.0	17.0	16.9	16.9	16.9
Av. final wt., lb.	31.8	36.0	35.4	34.0	36.1	37.0
Av. daily gain, lb.						
Rep. I	0.49	0.75	0.68	0.56	0.72	0.79
Rep. II	0.58	0.61	0.64	0.65	0.65	0.64
Ave.	0.53	0.68	0.66	0.60	0.68 ^{b/}	0.72 ^{b/}
Feed/pig/day, lb.	1.32	1.38	1.26	1.20	1.22	1.51
Feed/lb. gain, lb.	2.46	2.02	1.91	1.98	1.78	2.11

^{a/} Two replicated lots of six pigs each per treatment.

^{b/} Significantly greater than Lot 1 (5% level).

erythromycin had

Pigs fed a ration containing 5, 10, 25 or 50 gms. per ton of an average gain from 13.2 to 28.3 percent faster than the pigs fed the basal ration. Some variation existed between the replicate lots but in all cases the erythromycin fed pigs gained at the faster rate. Aureomycin fed at a level of 100 grams per ton produced a 35.8 percent increase in average daily gain.

Improved feed efficiency in the erythromycin lots averaged from 17.9 to 27.6 percent. The 50 gram level of erythromycin gave the greatest improvement and the 5 gram level the least. Pigs fed aureomycin had a 14.2 percent improvement in feed efficiency as compared to the control pigs.

Table 3. (Trial 2) Antibiotics in Starter Rations for Pigs From 4 to 8 Weeks of Age.

Antibiotic	Lot 1	Lot 2	Lot 3	Lot 4	Lot 5	Lot 6
	None	Aureo- mycin	Erythro- mycin	Aureomycin and Erythromycin	SPS ^{a/}	SPS ^{a/}
Grams per ton	None	50	10	50 and 10	50	100
No. of pigs ^{b/}	15	15	14	14	14	13
Av. initial wt., lb.	16.3	16.4	15.9	16.4	16.6	16.8
Av. final wt., lb.	28.3	29.8	30.9	30.8	33.6	34.4
Av. daily gain, lb.						
Rep I	0.51	0.56	0.63	0.58	0.66	0.66
Rep II	0.33	0.38	0.48	0.42	0.53	0.58
Ave.	0.43	0.48	0.55	0.51	0.60 ^{c/}	0.63 ^{c/}
Feed/pig/day, lb.	0.88	0.83	1.09	1.01	0.91	0.98
Feed/lb. gain, lb.	2.05	1.73	1.98	1.99	1.52	1.56

^{a/} Streptomycin 41.8%, Penicillin 16.4%, Sulfaquinoxaline 41.8%.

^{b/} Eight pigs were allotted in replicate I and 7 in replicate II. One pig died in each of lots 3, 4 and 5 and two pigs died in Lot 6.

^{c/} Significantly greater than Lot 1, (1% level).

In trial 2 aureomycin at a level of 50 grams per ton improved gains 11.6 percent and feed efficiency 15.6 percent. Ten grams per ton of erythromycin resulted in 27.9 percent faster gains and a 3.4 percent improvement of feed efficiency. The combination of these two antibiotics did not give any improvement over a single antibiotic alone. The increase in gains over the controls averaged 18.6 percent and feed efficiency was improved 2.9 percent.

Pigs receiving the rations containing streptomycin-penicillin-sulfaquinoxaline made the fastest and most efficient gains. There was very little difference in response between the pigs receiving 50 or 100 grams per ton of this antibiotic combination. Compared to the pigs fed the basal ration the rate of gain was 39.5 and 46.5 percent faster and feed efficiency 25.8 and 23.9 percent better for the 50 and 100 gram levels respectively.

Table 4. (Trial 3) Effects of Furazolidone in Starter Rations for Pigs From 4 to 8 Weeks of Age

Additive	Lot 1 None	Lot 2 Aureo- mycin	Lot 3 Furazo- lidone	Lot 4 Furazo- lidone	Lot 5 Furazo- lidone	Lot 6 Aureomycin and Furazolidone
Grams per ton	None	50	100	150	200	50 and 100
No. of pigs ^{a/}	16	15	16	16	15	15
Av. initial wt., lb.	16.1	16.1	16.2	16.3	16.4	16.2
Av. final wt., lb.	28.0	29.7	29.8	32.0	33.8	32.4
Av. daily gain, lb.						
Rep I	0.42	0.44	0.50	0.64	0.61	0.52
Rep II	0.41	0.52	0.46	0.48	0.63	0.62
Ave	0.42	0.48	0.48	0.56 ^{b/}	0.62 ^{c/}	0.58 ^{c/}
Feed/pig/day, lb.	0.89	0.93	0.92	1.10	1.07	1.02
Feed/lb. gain, lb.	2.13	1.94	1.91	1.96	1.72	1.77

^{a/} Two replicated lots of 8 pigs each per treatment. One pig died in each of Lots 2, 5 and 6 in replicate I.

^{b/} Significantly greater than Lot 1 (5% level).

^{c/} Significantly greater than Lot 1 (1% level).

In trial 3 a nitrofurantoin product called furazolidone was fed at three different levels. The 100 gm. per ton level compared favorably with 50 gm. of aureomycin. Both additives increased gains 0.06 lb. per day (14.3 percent) and feed efficiency about 10 percent. When 150 gm. of furazolidone was fed pigs gained 0.14 lb. per day faster than the controls and 0.08 lb. per day faster than those fed 100 gm. of furazolidone or aureomycin. The 200 gm. level gave a still better response that was quite consistent between replicate lots. These pigs gained 0.20 lb. per day faster (47.6 percent) than the pigs fed the basal ration and required 19.2 percent less feed per pound of gain. The combination of 100 gm. of furazolidone and 50 gm. of aureomycin per ton of feed was better than either of these alone. Rate of gain was increased 0.16 lb. per day (38 percent) and feed efficiency was improved 16.9 percent.