

Effects of Bacitracin Pellets Implanted Subcutaneously in Pigs¹

PROJECT 513

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Forty-seven new-born pigs from six gilts were randomized to three groups. The pigs in Group I were untreated and served as controls. Each pig in Group II was implanted subcutaneously, posterior to the right ear, with a bacitracin pellet 36 hours after birth. The pigs in Group III were implanted with a slow-absorbing, zinc-aluminum-bacitracin pellet in a similar manner. All pellets each contained 1,000 units of bacitracin.

Blood samples were taken from the anterior vena cava 36 hours after birth and at 1, 2, 3, 4, 5, 6, 7, and 8 weeks of age. At each bleeding time the pigs were weighed.

Results

The growth of the nursing pigs was not altered by the implanted antibiotic pellets as shown in Table 29.

From the standpoint of the blood picture, the values were not altered by the bacitracin pellets. Clinical cases of nutritional anemia were not observed. As a rule, such cases are seen when the pigs are 2 to 3 weeks of age. There was evidence, however, of subclinical anemia occurring at 2 to 3 weeks of age in all groups. This finding was revealed by studying the red blood cells and hemoglobin. At 4 weeks of age, the blood values had returned to normal.

Conclusions

1. Bacitracin pellets implanted subcutaneously in new-born pigs did not alter the weekly growth rate in 35 pigs as compared with 16 untreated pigs.

2. The blood picture was not affected by the implanted bacitracin pellets.

Table 29.—Effect on the weight of pigs when implanted with bacitracin pellets shortly after birth.

Group	No. pigs in group	36 hours	Age, weeks							
			1	2	3	4	5	6	7	8
Average weight, pounds										
I, Cont.	16	2.7	4.7	7.8	10.0	11.7	14.4	17.6	21.3	25.6
II, Imp.	15	2.6	4.9	7.8	9.9	11.8	14.6	18.4	20.6	26.0
III, Imp.	16	2.7	4.5	7.6	9.8	11.4	14.2	17.2	20.6	24.6
Av.		2.6	4.7	7.7	9.9	11.6	14.4	17.8	20.8	25.4

Levels of Aureomycin and the Comparative Value of Dehydrated Alfalfa and *Elodea canadensis* Meals in Swine-fattening Rations.*

PROJECT 301

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The amount of antibiotic generally recommended in swine-fattening rations is 5 mg. per pound of total feed consumed. Some workers have felt that higher levels might produce more rapid and economical gains. One purpose of this test was to compare results with 5 and 20 mg. of aureomycin per pound of complete feed.

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* The dehydrated *Elodea canadensis* meal was supplied by A. J. Stephens, Basswood Gardens, Kansas City, Mo., and the Aurofac 2A by Ralph Elliot, Lederle Laboratories, Pearl River, N.Y.

Elodea canadensis is a plant which grows in fresh-water lakes and ponds. Upon dehydration and grinding, it looks about the same as dehydrated alfalfa meal. The second purpose of this experiment was to compare the value of dehydrated alfalfa and *Elodea canadensis* meals in swine-fattening rations. Table 30 gives the chemical analysis of the *Elodea canadensis* meal used.

Experimental Procedure

Sixteen weanling pigs were divided as equally as possible into lots of four pigs each on the basis of weight, sex, and breed. The pigs were fed a complete ration, shown in Table 31. It contained about 18 percent protein and was fed till the pigs reached approximately 75 pounds body weight. The protein level of the ration was 15 percent from 75 to approximately 125 pounds body weight. It was then lowered to 12 percent protein for the remainder of the experiment. Adjustments in protein were made by adding corn and removing part of the tankage and soybean meal. Aureomycin was added in the form of Aurofac 2A. *Elodea canadensis* was substituted for equal amounts of alfalfa meal. Water was available at all times.

Results and Discussion

The results of the experiment are shown in Table 32. There was a difference in rate of gain of 0.08 pound in favor of the 20-milligram level of aureomycin, and essentially no difference in feed efficiency. There was 0.18 pound difference in daily gain in favor of the *Elodea canadensis* over alfalfa meal; however, there was no difference in feed efficiency.

It should be pointed out that Lot 1 pigs obviously did not do so well as they should have. Therefore, the differences observed are probably greater than they should be. The data indicate that: (1) there is no economic advantage to feeding high levels of aureomycin to fattening pigs; (2) *Elodea canadensis* is equal or superior to alfalfa meal in pig fattening rations when fed at levels used in this experiment.

Table 30.—Chemical analysis of dehydrated *Elodea canadensis*.

	%
Moisture	9.38
Crude protein	12.31
Ether extract	1.69
Crude fiber	15.00
Nitrogen-free extract	41.27
Ash	20.35
Calcium	3.72
Phosphorus	0.20
Carotene	48.0 mg. per lb.

Table 31.—Composition of experimental ration.

Ingredient	%
Yellow corn	73.5
Soybean oil meal	12.0
Tankage, 60% protein	10.0
Dehydrated alfalfa meal*	3.0
Steamed bone meal	0.5
Ground limestone	0.5
Salt	0.5
	100.0

* Lots 2 and 4 received dehydrated *Elodea canadensis* meal instead of alfalfa meal.

Table 32.—Pig-fattening results on (1) levels of aureomycin, (2) comparative value of dehydrated alfalfa and *Elodea canadensis* meals.
(November 16, 1954, to March 4, 1955—108 days)

	5 mg. aureomycin per pound feed		20 mg. aureomycin per pound feed	
	Alfalfa meal	<i>Elodea</i> <i>canadensis</i>	Alfalfa meal	<i>Elodea</i> <i>canadensis</i>
Lot number	1	2	3	4*
Number pigs per lot	4	4	4	4
Av. initial wt. per pig, lbs.	39	37	37	38
Av. gain per pig, lbs.	155	194	183	171
Av. final wt. per pig, lbs.	194	231	220	209
Av. daily gain per pig, lbs.	1.44	1.80	1.69	1.70
Av. daily feed per pig, lbs.	5.6	6.9	6.4	6.6
Av. feed per 100 lbs. gain, lbs.	389	382	377	386
Av. daily gain all pigs on 5 mg. aureomycin, lbs.		1.62		
Av. daily gain all pigs on 20 mg. aureomycin, lbs.		1.70		
Av. daily gain all pigs on alfalfa meal, lbs.		1.57		
Av. daily gain all pigs on <i>Elodea canadensis</i> , lbs.		1.75		

* 1 pig slaughtered at 180 lbs.

Antibiotics for Growing-Fattening Swine

PROJECT 361*

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Certain antibiotics are generally considered to be desirable and economically practical in growing-fattening rations of swine. In most cases, there has been an increase in rate of gain and some increase in feed efficiency.

This experiment was designed to study, with littermates, the effect of aureomycin and terramycin upon rate of growth feed efficiency, digestibility of feed, and nitrogen balance. This report gives a summary of four feedlot and three metabolism trials. Carcass data on these pigs are reported under Project 217.

Experimental Procedure

Duroc Jersey and Poland China littermates of the same sex were used in each trial; however, males were used in trials 1 and 3, and females in trials 2 and 4. The pigs were selected for uniformity as much as possible and allotted at random into three groups. Group 1 was assigned the basal ration; group 2, basal plus 10 mg. of Aureomycin HCl per pound of feed, and group 3, basal plus 10 mg. of Terramycin HCl per pound of feed. Aureomycin HCl was supplied from Aurofac 2A and Terramycin HCl from Bi-Con TM5. All pigs in trials 1 and 2 were treated with sodium fluoride to remove worms. Pigs in trials 3 and 4 were not treated. A complete ration was used and the pigs were individually self-fed. The ration contained 18 per-

* This project was partially supported by Lederle Laboratories, Pearl River, N.Y.

cent protein until the pigs reached approximately 75 pounds body weight. It was then lowered to 15 percent protein until the pigs reached 125 pounds body weight. The protein was reduced to 12 percent for the remainder of the feeding period. Table 33 shows the composition of the basal ration. The pigs were slaughtered at approximately 225 pounds for carcass studies.

At approximately 100 pounds, each pig was placed in a metabolism crate for seven days to collect urine and feces for digestion and nitrogen balance studies. The pigs were self-fed while in the crates.

Table 33.—Basal ration.

Ingredient	% fed to 75 lbs.	% fed from 75 to 125 lbs.	% fed from 125 to 225 lbs.
	Yellow corn	73.5	80.5
Soybean oil meal	12.0	8.0	5.0
Tankage	10.0	7.0	4.0
Dehydrated alfalfa meal	3.0	3.0	2.0
Steamed bone meal	0.5	0.5	0.5
Ground limestone	0.5	0.5	0.5
Salt	0.5	0.5	0.5
Total	100.0	100.0	100.0
% protein	18.0	15.0	12.0

Results

Table 34 gives the results of each trial and a summary of all trials on growth rate, feed efficiency, and the number of roundworms found at time of slaughter. Results of the metabolism studies are shown in Table 35. The antibiotics had no significant influence upon the digestibility of the feed or the nitrogen retained.