

South Dakota State University  
**Open PRAIRIE: Open Public Research Access Institutional  
Repository and Information Exchange**

---

South Dakota Swine Field Day Proceedings and  
Research Reports, 1978

Animal Science Reports

---

1978

# Effect of Level and Source of Dietary Calcium on the Response of Pigs to Antibiotics

John Balios

*South Dakota State University*

George W. Libal

Richard C. Wahlstrom

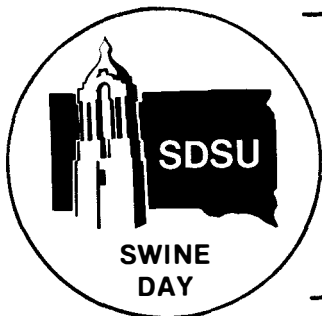
Follow this and additional works at: [http://openprairie.sdstate.edu/sd\\_swine\\_1978](http://openprairie.sdstate.edu/sd_swine_1978)

---

## Recommended Citation

Balios, John; Libal, George W.; and Wahlstrom, Richard C., "Effect of Level and Source of Dietary Calcium on the Response of Pigs to Antibiotics" (1978). *South Dakota Swine Field Day Proceedings and Research Reports, 1978*. Paper 5.  
[http://openprairie.sdstate.edu/sd\\_swine\\_1978/5](http://openprairie.sdstate.edu/sd_swine_1978/5)

This Report is brought to you for free and open access by the Animal Science Reports at Open PRAIRIE: Open Public Research Access Institutional Repository and Information Exchange. It has been accepted for inclusion in South Dakota Swine Field Day Proceedings and Research Reports, 1978 by an authorized administrator of Open PRAIRIE: Open Public Research Access Institutional Repository and Information Exchange. For more information, please contact [michael.biondo@sdstate.edu](mailto:michael.biondo@sdstate.edu).



---

## EFFECT OF LEVEL AND SOURCE OF DIETARY CALCIUM ON THE RESPONSE OF PIGS TO ANTIBIOTICS

John Balios, George W. Libal, and Richard C. Wahlstrom

Department of Animal Science  
Swine Section

South Dakota State University  
A.S. Series 78-12

---

Antibiotics have been widely used for growth promotion of livestock for the last 30 years. The literature contains numerous references as to the growth promoting effects of antibiotics in various species. However, little has been reported on the effect of the diets or constituents of the diets on the biological activity of the antibiotics. Early work has shown that broad spectrum antibiotics, such as terramycin and aureomycin, may complex with various metallic cations, such as zinc, manganese, calcium, magnesium, etc., thus inhibiting action of the antibiotics.

The experiment reported here is a part of a study to determine the effect of the level and source of calcium on the performance of growing pigs fed a conventional type diet with and without aureomycin.

### Experimental Procedure

One hundred twenty-eight pigs of an average weight of about 71 lb. were allotted to eight treatments each replicated four times in a 2 x 2 x 2 factorial experiment. The pigs were housed in an enclosed confinement building and had access to feed and water at all times.

All diets were calculated to have a 1:1 ratio of calcium to phosphorus and 14% crude protein. Diets 1 through 4 contained .40% calcium and .40% phosphorus, while diets 5 through 8 contained .67% calcium and .67% phosphorus. In diets 1, 2, 5 and 6, calcium was supplied by calcium sulfate and in 3, 4, 7 and 8 by calcium carbonate. All diets were supplemented with sodium phosphate to supply the required phosphorus. Table 1 shows the composition of the diets. The experiment was conducted for 6 weeks.

### Results and Discussion

Table 2 summarizes the data obtained from this experiment. Although there were no significant differences in daily gains or feed efficiency, pigs treated with aureomycin grew slightly faster. This difference was more obvious when calcium was supplied by calcium sulfate. Also, pigs fed diets containing aureomycin and calcium sulfate required about .1 lb. less feed per pound of gain than pigs fed this diet without aureomycin.

No definite conclusions can be made from this part of the study, although it is possible that lower levels of calcium and higher levels of aureomycin could give us more information of the potentiating effect of low calcium diets. Further research is planned in this area.

Summary

One hundred twenty-eight pigs of an average weight of about 71 lb. were utilized in this experiment to study the effect of level and source of calcium on the response to aureomycin. Pigs fed diets containing calcium supplied by calcium sulfate and aureomycin tended to grow a little faster and utilize feed more efficiently than pigs fed these diets without aureomycin. However, these differences were not significant. Differences in gain and feed/gain between pigs fed diets containing calcium sulfate or calcium carbonate were small and nonsignificant.

Table 1. Composition of Diets (Percent)

Ingredient	Treatments <sup>a</sup>			
	1,2	3,4	5,6	7,8
Corn	84.2	85.1	81.4	83.0
Soybean meal (48% crude protein)	13.4	13.2	13.9	13.6
Calcium sulfate	1.6	--	2.9	--
Calcium carbonate	--	.9	--	1.6
Sodium phosphate	.2	.2	1.2	1.2
Trace mineral salt	.4	.4	.4	.4
Premix <sup>b</sup>	.2	.2	.2	.2

<sup>a</sup> Treatments 1, 3, 5 and 7 received premix with aureomycin to supply 50 grams per ton.

<sup>b</sup> Supplied per lb. of diet: vitamin A, 1500 IU; vitamin D, 150 IU; vitamin E, 2.5 IU; vitamin K, 1 mg; riboflavin, 1.25 mg; pantothenic acid, 5 mg; niacin, 8 mg; choline, 50 mg; vitamin B<sub>12</sub>, 5 mcg and aureomycin, 25 milligrams.

Table 2. Effect of Level and Source of Calcium on the Performance of Growing Pigs<sup>a,b</sup>

	Treatments							
	1	2	3	4	5	6	7	8
No. of pigs	16	16	16	16	16	16	16	16
Avg initial wt., lb.	71.2	71.2	71.2	71.4	71.4	71.3	71.2	71.2
Avg final wt., lb.	139.3	136.3	135.9	136.4	139.6	135.5	140.3	139.0
Avg daily gain, lb.	1.62	1.55	1.54	1.54	1.63	1.53	1.64	1.61
Feed/gain	3.28	3.37	3.27	3.24	3.24	3.39	3.26	3.27

<sup>a</sup> Diets 1, 3, 5 and 7 contained aureomycin to supply 50 grams per ton.

<sup>b</sup> Diets 1, 2, 5 and 6 contained calcium sulfate to supply calcium, while in diets 3, 4, 7 and 8 calcium was supplied by calcium carbonate (limestone).