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SUPPLEMENTAL LYSINE IN FEED AND WATER FOR GROWING-FINISHING SWINE

A. R. Taylor and R. C. Wahlstrom

At the 1966 South Dakota Swine Field Day information was reported (A.S. Series 66-22) on the effects of lysine in feed and water at comparable levels when the level of crude protein was slightly lower than normally recommended for the respective weight of the pigs. It was reported that pigs receiving lysine in the water gained slightly faster and considerably more efficiently than pigs that did not receive lysine or those fed lysine in the feed. In order to obtain more data on the effect of lysine in the feed or water for young pigs the experiment was repeated and is reported herein.

Experimental Procedure

Five experimental treatments of eight pigs each were used in this trial. Four barrows and four gilts were assigned to each group at approximately 3 weeks of age and averaging 16 lb. The groups were assigned at random to each treatment. The treatments were:

- Lot 1 - Basal ration
- Lot 2 - Basal ration + high level of lysine in water
- Lot 3 - Basal ration + 0.1% lysine in feed
- Lot 4 - Basal ration + low level of lysine in water
- Lot 5 - Basal ration + 0.3% lysine in feed

An attempt was made to obtain equal intakes of supplemental L-lysine monohydrochloride in feed and water. Lysine was added to the basal rations of lots 3 and 5 at 0.1% and 0.3%, respectively. The levels of lysine in the water of lots 2 and 4 were adjusted to maintain a similar lysine intake to that of pigs fed 0.1 or 0.3% in the feed. Feed and water consumption was measured continuously and the quantity of lysine intake was calculated.

All pigs were self-fed the ration shown in table 1. The period of feeding each ration is also shown in the table. Water was provided ad libitum to all pigs. The pigs were kept on concrete in combination sleeping quarters and outside feeding pens. All animals were taken off test after 99 days due to lack of facilities for fall experiments and due to the wide variations between and within pens.

Results

The results of this experiment are shown in table 2. Average daily gain was improved 18.4 percent (from 0.87 to 1.03 lb. per day) when pigs received 0.1% lysine in either the feed or drinking water. Feed efficiency was also improved by this lower level of lysine. The improvement in feed efficiency was 5.2 and 6.6% when pigs received 0.1% lysine in the water or feed, respectively.

Table 1. Composition of Rations, Lb.

Feeding period	3 to 6 weeks of age	6 to 10 weeks of age	10 weeks to 75 lb.	75 to 150 lb.
Crude protein	18%	16%	14%	12%
Shelled corn	390	540	843	890
Rolled oats	300	300	--	--
Soybean meal (50%)	130	130	128	80
Dried skim milk	100	--	--	--
Sugar	50	--	--	--
Dicalcium phosphate	15	16	16	18
Limestone	5	6	5	3
T. M. salt	5	5	5	5
Trace mineral	0.5	0.5	--	--
Vitamin-antibiotic premix	a	a	b	b

^a Provided 1135 I.U. vitamin A, 340 I.U. vitamin D, 4 mg. riboflavin, 8 mg. calcium pantothenate, 16 mg. niacin, 20 mg. choline chloride, 10 mcg. vitamin B₁₂ and 1.13 gm. SP-250 per pound of ration.

^b Provided 1135 I.U. vitamin A, 340 I.U. vitamin D, 2 mg. riboflavin, 4 mg. calcium pantothenate, 9 mg. niacin, 10 mg. choline chloride, 7 mcg. vitamin B₁₂ and 5 mg. chlortetracycline per pound of ration.

Table 2. Results of Lysine in the Feed or Water

	Control	Lysine in feed		Lysine in water (feed equivalent)	
		0.1%	0.3%	0.1%	0.3%
Number of pigs	8	8	8	8	8
Av. initial wt., lb.	16.13	16.00	15.87	15.75	16.25
Av. final wt., lb.	102.38	117.88	139.00	117.75	137.00
Av. daily gain, lb.	0.87	1.03	1.24	1.03	1.22
Av. daily feed, lb.	2.49	2.75	3.13	2.79	3.09
Av. daily water, gal.	0.83	0.69	0.78	0.71	1.00
Av. feed per lb. gain, lb.	2.86	2.67	2.52	2.71	2.53
Av. daily lysine, gm.	--	1.25	4.26	1.13	4.15

Pigs receiving the 0.3% level of lysine in feed or water also performed quite similarly. Average daily gains of pigs receiving the 0.3% level of lysine were approximately 41.4% faster than those pigs fed the basal ration and 19.4% faster than those pigs receiving 0.1% lysine in feed or water. Feed efficiency was improved approximately 11.7 and 6.1% when pigs received 0.3% lysine as compared to those fed the basal ration or receiving 0.1% lysine.

The results of this trial indicate an improvement in rate of gain and feed efficiency of young pigs when fed lysine either in the feed or drinking water when their rations are minimal in protein content. A level of 0.3% lysine was more adequate than the lower level of 0.1% lysine. These results are not in complete agreement with previous work from this station which reported little response from lysine in the feed at either the 0.1 or 0.3% level and an equal response from pigs receiving lysine in the water at the 0.1 or 0.3% levels. It was noted in the present experiment that considerable variation existed among pigs within the same treatment group. It is possible that by reducing the protein level of the ration at periodic intervals more stress was placed on slower gaining pigs.