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Flavor enhancers and/or Vitamin C in growing-finishing rations

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Summary

Supplemental vitamin C fed at two different levels (550 or 1,100 mg. per kg. of diet) did not improve animal performance at the swine research center. Adding apple flavor or sodium bicarbonate did not change results.

Introduction

In swine research at Kansas State University we continue to look for a flavor-enhancing agent that, when included in a pig's ration over an extended time, will increase the animal's total energy intake and thus increase its growth rate and improve its feed efficiency. At the same time we have been feeding supplemental vitamin C to swine because in the pig there is a direct relationship between serum ascorbate (vitamin C) levels and energy intake. It is generally believed that pigs do not need an external source of vitamin C, but according to some published reports growing pigs do respond to supplemental C, especially when any form of stress is involved.

Procedure

In trial I, 40 pigs averaging 56.7 kilograms were allotted to one of four treatments by litter, sex, and weight (10 pigs per group). They were housed on totally slatted floors in our modified-environment-finishing barn during February, March,

and April, 1977.

The 15% protein basal diet contained 37.5% ground milo, 36.5% ground corn, 22.5% soybean meal (44%), 1.25% dicalcium phosphate, 1.0% ground limestone, 0.4% salt, 0.6% vitamin-trace mineral premix, and an antibiotic. Stabilized vitamin C (1-ascorbic acid) was added to indicated rations (1,100 mg. per kg.). Synthetic apple flavor was added to indicated rations (1,000 mg. per kg.).

In trial II, 64 pigs averaging 59.0 kilograms were allotted to one of four treatments by litter, sex, and weight (8 pigs per group replicated). They too were housed on totally slatted floors in our modified-environment-finishing barn but during May, June, and July, 1977.

The 15% protein basal diet contained 78.5% milo, 18.0% soybean meal (44%), 1.25% dicalcium phosphate, 1.0% ground limestone, 0.4% salt, 0.6% vitamin-trace mineral premix, and an antibiotic. Only stabilized vitamin C (1-ascorbic acid) was added to each of 2 rations at indicated levels (550 or 1,100 mg. per kg.). Stabilized vitamin C (1,100 mg. per kg.) plus synthetic apple flavor (1,000 mg. per kg.) plus bicarbonate of soda (2,000 mg. per kg.) were added to a third ration.

Results and Discussion

Performance of pigs in trial I is summarized

in table 21 . As shown, adding synthetic apple flavor or vitamin C either singly or in combination did not significantly improve average daily gain or feed efficiency. One pig with swollen and stiff joints was removed from each treatment pen.

In trial II, as summarized in table 22 , pigs did not improve significantly in average daily gain or feed efficiency when fed supplemental vitamin C at two different levels. Apple flavor plus sodium bicarbonate, when fed along with vitamin C, also failed to improve performance or appearance. Two pigs with swollen and stiff joints were removed from one treatment.

On day 70 all pigs in trial II showed some evidence of a severe viral infection. They consumed much less feed than normal and their hair coats were rough; some had an elevated temperature plus diarrhea. For 3 days all pigs were injected with Tylosin. Symptoms, similar in severity in all groups, disappeared after 3 or 4 days.

Table 21 . Trial I. Performance of growing pigs receiving synthetic apple flavor or vitamin C, as indicated in feed.

| Treatment: | Control | + Apple | + Vit. C ^a | + Apple + vit. C ^a |
|-----------------------|---------|---------|-----------------------|-------------------------------|
| No. of animals | 10 | 9* | 9* | 9* |
| Avg. initial wt., kg. | 56.9 | 56.1 | 55.6 | 56.2 |
| Avg. final wt., kg. | 98.9 | 99.0 | 93.1 | 100.8 |
| Avg. daily gain, kg. | 0.78 | 0.80 | 0.69 | 0.85 |
| Avg. daily feed, kg. | 2.66 | 2.22 | 2.08 | 2.55 |
| feed/gain | 3.42 | 3.11 | 3.32 | 3.09 |

*One pig removed for reasons not related to treatment.

^a Furnished by Hoffman-LaRoche, Inc.

Table 22. Trial II. Performance of pigs fed indicated diets.

| Treatment: | Control | + Vit. C ^a | + ½ Vit. C ^a | + NaHCO ₃ + apple + Vit. C ^a |
|-----------------------|---------|-----------------------|-------------------------|--|
| No. of animals | 16 | 16 | 16 | 14* |
| Avg. initial wt., kg. | 47.1 | 47.1 | 47.2 | 48.2 |
| Avg. final wt., kg. | 103.0 | 102.1 | 99.8 | 101.3 |
| Avg. daily gain, kg. | 0.68 | 0.65 | 0.63 | 0.64 |
| Avg. daily feed, kg. | 2.39 | 2.26 | 2.24 | 2.13 |
| Feed/gain | 3.60 | 3.46 | 3.60 | 3.38 |

* Two pigs removed for reasons not related to treatment.

^a Furnished by Hoffman - LaRoche, Inc.