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Abstract

A growth trial and a nitrogen retention trial were conducted to determine the sulfur amino acid requirement of the growing pig. Adding 0.10% DL-methionine to a 14.1% protein basal diet containing 0.21% sulfur amino acids significantly (P<.05) increased daily gain and nitrogen retention. Further additions gave no beneficial effect, indicating that the sulfur amino acid requirement had been met by the initial addition of DL-methionine. Thus, the sulfur amino acid requirement of the growing pig fed a 14.1% protein diet does not exceed 0.31% of the diet.; Swine Day, Manhattan, KS, November 14, 1974

Keywords

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Sulfur Amino Acid Requirement of the Growing Pig

Mike Trotter and Gary L. Allee

Summary

A growth trial and a nitrogen retention trial were conducted to determine the sulfur amino acid requirement of the growing pig. Adding 0.10% DL-methionine to a 14.1% protein basal diet containing 0.21% sulfur amino acids significantly ($P<.05$) increased daily gain and nitrogen retention. Further additions gave no beneficial effect, indicating that the sulfur amino acid requirement had been met by the initial addition of DL-methionine. Thus, the sulfur amino acid requirement of the growing pig fed a 14.1% protein diet does not exceed 0.31% of the diet.

Introduction

NRC (1968) lists the methionine requirement of growing pigs (40 to 80 pounds) as 0.50% of the diet. Numerous researchers, however, have been unable to obtain any beneficial response by adding methionine to diets containing a lower level of sulfur amino acids than is currently recommended, which suggests that the sulfur amino acid requirement of the growing pig has been overestimated.

Using a semi-purified diet supplemented with graded levels of DL-methionine we re-evaluated the sulfur amino acid requirement of growing pigs.

Procedure

General. In the growth trial (trial 1), pigs were housed in wooden cages with expanded metal floors in a building where temperature was maintained at approximately 75° F. Feed and water were supplied ad libitum. Initial and final weights were recorded and daily gain, feed efficiency, and daily feed intake were determined at the conclusion of the 28-day trial.

In the nitrogen retention study (trial 2), pigs were housed individually in metabolism cages allowing for separate collection of feces and urine.

The basal diet was composed of 15.0% isolated soybean protein, 74.6% cornstarch, 3.0% cellulose, 3.0% soybean oil, 2.78% dicalcium phosphate, 1.5% vitamin, trace mineral mix and antibiotic premix, 0.05% L-threonine, and 0.06% L-lysine·HCl.

Trial 1. Twenty-four Duroc and Yorkshire barrows and gilts averaging 27 pounds were allotted according to weight, breed and sex to four treatment groups (table 9.1): (1) basal, (2) basal + 0.10% DL-methionine, (3) basal + 0.20% DL-methionine, and (4) basal + 0.30% DL-methionine. The trial, consisting of three replications of two pigs per pen, lasted 28 days.

Trial 2. Three groups of four littermate Duroc and Yorkshire barrows were used in a randomized complete block design and allotted to four treatments (table 9.2) as in trial 1. All rations were made isonitrogenous by adding glutamic acid.

Results and Discussion

Trial 1. Results are presented in table 9.1. Supplementing the basal diet with 0.10% DL-methionine significantly (P<.05) improved daily gain, but further additions of DL-methionine improved neither daily gain nor feed efficiency.

Trial 2. Results are presented in table 9.2. Nitrogen retention was maximized when basal diet was supplemented with 0.10% DL-methionine.

Adding 0.10% DL-methionine to the basal diet (0.21% total sulfur amino acids) markedly improved daily gain and nitrogen retention. Further additions had no beneficial effect, suggesting that the sulfur amino acid requirement of growing pigs was met by adding 0.10% DL-methionine. The sulfur amino acid requirement of the growing pigs fed a 14% protein diet does not exceed 0.31% of the diet. Therefore, our results suggest that supplementing most practical swine diets (milo or corn supplemented with soybean meal) with methionine will not result in any beneficial response.

Table 9.1. Performance of Growing Pigs Fed Graded Levels of DL-Methionine[a] (Trial 1)

Diets	Daily gain (lbs.)	Feed/ gain[b]	Feed intake (lbs.)
1. Basal	0.75[c]	2.38	1.78
2. Basal + 0.10% DL-methionine	1.12[d]	1.98	2.22
3. Basal + 0.20% DL-methionine	1.08[d]	1.99	2.15
4. Basal + 0.30% DL-methionine	1.15[d]	1.98	2.28

[a]Six pigs, averaging 27 pounds initially, per diet.

[b]Feed/gain and feed intake are pen means (two pigs per pen, three pens per treatment).

[cd]Means with different superscripts are statistically different (P<.05).

Table 9.2. Nitrogen Retention of Growing Pigs Fed Graded Levels of DL-Methionine[a] (Trial 2)

Diets	Daily N, g			
	Intake	Urine	Feces	Retained
1. Basal	27.25	9.60	1.48	16.17[b]
2. Basal + 0.10% DL-methionine	27.25	6.79	1.37	19.09[c]
3. Basal + 0.20% DL-methionine	27.25	6.53	1.91	18.81[c]
4. Basal + 0.30% DL-methionine	27.25	7.17	1.61	18.57[c]

[a]Six pigs, averaging 40 pounds, per diet.

[bc]Means with different superscripts are statistically different (P<.05).