Basic amino acids and cations Interrelationships between lysine/arginine and lysine/potassium/sodium

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The purpose of these two experiments was to study the relationships between dietary lysine and arginine levels. One hundred and eighty 6-week-old piglets (mean weight : 11 kg) were divided into 5 groups corresponding to the *ad libitum* feeding of one of the five experimental diets. The components, lysine and arginine levels and arginine/lysine ratio were :

(1) Maize - skimmed milk - groundnut meal - 0.96 - 1.53 - 1.59.
(2) (1) + lysine - 1.56 - 1.53 - 0.98.
(3) Maize - skimmed milk - groundnut meal - 0.95 - 0.95 - 1.00.
(4) Maize - skimmed milk - 0.98 - 0.72 - 0.73.
(5) (4) + arginine - 0.98 - 0.93 - 0.95.

Improvement in the performance was due to the lysine level or to the milk percentage in the formula rather than to the arginine/lysine ratio.

The second experiment was carried out with pigs weighing 21 kg and fed one of the following 5 diets for 42 days :

(1) Basal diet : 0.60 p. 100 lysine - 0.79 arginine - A/L = 1.32.
(2) (1) + 0.24 p. 100 lysine - A/L = 0.94.
(3) (1) + 0.60 p. 100 arginine - A/L = 2.32.
(4) (1) + 0.24 p. 100 + 0.60 p. 100 arginine - A/L = 1.65.
(5) (1) + 0.48 p. 100 lysine + 0.60 p. 100 arginine - A/L = 1.29.

Growth rate and feed efficiency were significantly improved when lysine was added (groups 2 - 4 - 5). The addition of arginine had no effect.

In the third experiment, carried out with 6-week old piglets (10.6 kg), six diets containing the following levels of lysine, potassium and sodium were compared :

(1) 0.60 - 0.47 - 0.15.
(2) 0.60 - 1.04 - 0.15.
(3) 0.60 - 0.47 - 0.56.
(4) 0.90 - 0.47 - 0.15.
(5) 0.90 - 1.04 - 0.15.
(6) 0.90 - 0.47 - 0.56.

The best performance was obtained with a lysine level of 0.90 p. 100. Increase in the potassium or sodium level had no effect, in particular when the lysine level was low : these cations seem not to be lysine « saving » factors.

Nutritional value and originality of tryptophan

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The first experiment (A) was carried out to study the effect of a tryptophan deficiency on feed intake of finishing pigs.

Fourty pigs, between 60 and 95 kg live weight, were fed one of the 4 diets containing the following amounts of lysine and tryptophan :