

Three diets with a lysine concentration of 6.8, 7.8 and 8.8 g/kg diet were offered ad libitum to the pigs individually penned from 25 to 95 kg live weight.

Daily feed intake of entire males and females was similar and lower (by 5-7 %) than that of castrated males.

Daily gain of entire males and castrated males was similar and lower (by 6-10 %) than that of females.

Feed efficiency measured by the feed conversion ratio was similar in females and castrated males (slightly better in the former). It was 8 % higher in entire males than in the other animals.

Muscle percentage was similar in carcasses of females and entire males and 6 % higher than that of castrated males. Carcasses of entire males exhibited the lowest fat content.

The maximum response to dietary lysine differed according to the sex, the parameter measured and the growth period (25-60 or 60-95 kg live weight). In entire males and females the better feed efficiency was obtained with 8.8 g lysine/kg diet, whereas in castrated males no further response was achieved above 7.8 g lysine/kg diet.

Higher levels of dietary lysine may be required to detect possible response differences between entire males and females.

Effect of protein and lysine level in the diet on growth performance and energy utilization in the growing pig

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Three diets containing 15.3 and 0.67 % (diet pl), 15.3 and 0.80 % (diet pL) and 17.8 and 0.80 % (diet PL) crude protein and lysine, respectively, were fed to female pigs with an initial live weight of 20 kg. Eight replicates of four littermates were used. In each replicate, one female was slaughtered at the start of the experiment and the three others were given the experimental diets and were slaughtered seven weeks later. Carcasses were dissected, minced and analysed to determine the nature (muscle, adipose tissue...) and chemical composition (protein, lipid...) of the gain and to measure energy and nitrogen balance over the experimental period. Average daily gain and gain in carcass and muscle or protein deposition were lower with the pl diet whereas fat deposition was higher. The decrease in the supply of non essential nitrogen (pL vs PL) did not change average daily gain or gain in carcass or muscle but tended to increase fat deposition. At similar ME intakes, heat production and excretion of nitrogen and energy in urine were higher in PL-fed pigs. Our results suggest that in order to keep constant the amount of retained energy a 1 % increase in the protein level of the diet (at similar limiting amino acid levels) requires 1.0 and 0.75 % additional supply of DE and ME, respectively.

Reduction in the protein content of diets for weaned piglets: contribution to the study of threonine requirement

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A trial was made in 384 piglets between 10.6 and 25 kg live weight housed in pens of 7 animals each and fed an experimental diet for 28 days from the 14th day after weaning. Four diets

containing 3.6 g lysine/1 000 kcal DE were compared. The control diet was based on wheat, soybean meal and mineral and vitamin mixture. Diets 2, 3 and 4 contained wheat (about 80 %), only 14.8 % soybean meal and were supplemented with 0.53 % lysine HCl, 0.07 % methionine and 0, 0.10 and 0.20 % threonine. The four diets contained 23.8, 18.3, 18.2, 17.7 % crude protein and 0.85, 0.62, 0.71 and 0.79 % threonine, respectively.

Feed intakes were similar with the four diets (1 034, 1 043, 1 065, 1 072 g/day). Weight gains were 595, 567, 611 and 626 g/d. The feed conversion ratio of diet 2 (1.84) was significantly different from that of diets 1, 3 and 4 (1.74, 1.74 and 1.71). The threonine requirement of weaned piglets between 11 and 25 kg was therefore estimated at 0.70 % of the diet, i.e. 60 % of the lysine requirement.

Sulphur amino acid requirements of piglets and growing pigs

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Four trials were made to study the sulphur amino acid requirements of weaned piglets and growing pigs.

In trial A, 4 diets containing 0.41, 0.49, 0.57 and 0.66 % methionine + cystine were fed ad libitum to piglets weighing initially 10 kg. After 28 days of experiment the best performance were obtained with the diet containing 0.49 % methionine + cystine (1.42 g M + C/1 000 kcal DE).

In trial B, the digestibility of diets containing 0.41 and 0.57 % methionine + cystine was compared. Digestibility and N and methionine retention were higher with the diet containing 0.57 % M + C.

In trial C, diets containing 0.39, 0.47, 0.55 and 0.63 % M + C were fed ad libitum to 24 growing pigs (12 castrated males and 12 females) between 25 and 95 kg live weight. Between 25 and 45 kg, the best performance were obtained with the diet containing 0.47 % M + C (1.40 g/1 000 kcal DE). The sulphur amino acid content of diet 1 (0.40 %, 1.20 g/1 000 kcal DE) appeared sufficient above 45 kg live weight.

In trial D, a control diet (T) containing 0.16 % methionine and 0.15 % cystine was compared to a diet TM (T + 0.08 % DL-methionine) and a diet TC (T + 0.08 % L-cystine). The trial was made in piglets weighing initially 10 kg fed ad libitum for 21 days. Methionine supplementation significantly improved performance. Cystine supplementation neither improved weight gain nor feed conversion ratio and decreased feed intake. It was concluded that methionine should represent at least 55 % of sulphur amino acid supply.

Harmful effects of dietary calcium excess in pigs fed a plant-phosphorus-rich diet

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Dietary calcium excess may decrease phytic P digestibility in hamsters and rats and bone breaking strength in pigs. An experiment was made to compare Ca and P balances, mineral content, density and bending moment of bones in pigs fed either a high (1.4 %) or a normal (0.6 %) Ca diet for 2 months. No inorganic P was added and the total P (0.5 %), of which 70 % was phytic, and vitamin D₃ (1 000 IU kg) contents were the same in both diets.