

for growth, after supplementation with lysine, was 14.8 p. 100 of a diet containing 85 p. 100 dry matter, corresponding to 45 g/Mcal DE.

A review of the requirement for total balanced protein in growing pigs is presented in the second part of the paper, taking into consideration the whole series of experiments performed on this subject and the recent literature. The following points were examined: significance of total protein requirement, possibility for reducing the total dietary protein after supplementing with the most limiting amino acids, optimum level of balanced protein for growth after supplementing with limiting amino acids. Recommended allowances were given for the supply of balanced proteins and lysine, according to the stage of growth (20-50 et 50-100 kg live weight), sex (females and castrated males), under conditions of moderately restricted feeding; both in daily amounts and in relation to energy (DE). The potential economy of dietary protein with the improvement of dietary amino acids balance is discussed in connection with the utilization of dietary energy.

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### Feed restriction of piglets after weaning : interaction with crude protein supply

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The experiment involved 30 litters including 180 piglets, aged exactly 21 days and weighing 5.5 kg on an average (confidence interval,  $\pm 0.9$  kg). The effects of a 25 p. 100 feed restriction compared *ad libitum* feeding were studied within litters during the two weeks following weaning comparing in each case three dietary protein contents 15, 20 and 25 p. 100 of constant quality (6.5 p. 100 lysine). The diet containing 20 p. 100 protein was offered *ad libitum* to each piglet between 35 and 49 days of age. After a transition period of one week with a second age diet containing 18 p. 100 protein without skimmed milk powder, the growth performance of piglets regrouped in litters were measured until 70 days of age.

After the first two weeks, the favourable effect of the protein content on growth rate was perfectly linear in piglets fed *ad libitum* (128, 160 and 197 g/d for 15, 20 and 25 p. 100 protein, respectively). On the other hand, the protein content did not affect growth rate of restricted piglets (122, 122 and 130 g/d for 15, 20 and 25 p. 100 protein, respectively). At 70 days of age, piglet weights ranged between 26 and 27.2 kg according to groups without significant differences. As compared with the group fed *ad libitum* a diet containing 25 p. 100 protein, the growth delays observed at 35 days remained minimum or decreased after administration of *ad libitum* diets containing 15 and 20 p. 100 protein or a restricted amount of a diet containing 20 p. 100 protein. In the latter case, the feed efficiency was maximum between 25 and 56 days of age : 616 g/kg versus 590, 591 and 613 with the first age diets containing 15, 20 and 25 p. 100 proteins offered *ad libitum*.

Growth delays of piglets receiving after weaning a restricted amount of feeds with extreme protein contents (15 and 25 p. 100) persisted (1.3 to 1.6 d/piglet) or increased in absolute value. Frequency of diarrhoea as well as piglet losses were not affected either by the protein content or by the feed restriction.

In conclusion, feeding piglets *ad libitum* with a diet containing 20 p. 100 well balanced proteins during the two weeks following weaning at the age of 3 weeks seems to be a satisfactory solution.

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