

Replacement of skim milk powder by soybean meal in the early weaning feeds for piglets

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The purpose of this study was to test the possible advantage of maintaining 10 p. 100 skim-milk powder in piglet diets. Three groups of piglets were fed during the two weeks following weaning a diet without milk, the same diet supplemented with lysine and a diet with milk, respectively, then a second age diet during the two following fortnights. A fourth group received a diet containing 10 p. 100 milk powder for the whole experiment. In every case, 10 kg milk powder replaced 6.5 kg soybean meal and 3.5 kg cereals.

Three successive trials were made on 96 piglets each weaned at the mean age of 32, 25 and 21 days and at the mean weight of 8.7, 7.1, and 6.6 kg.

The *feed intake* did not change significantly from one diet to another whatever the period. However, the discrepancies between the trials were very large in the first two weeks, trial I : 535 g/d ; trial II : 357 g/d ; trial III : 237 g/d and were more closely related to the age ($r = 0.94$) than to the weight at weaning ($r = 0.77$).

The *live weight gains* were comparable between the diets, whatever the period, in trial I (relatively older piglets) and in trial III (young piglets exhibiting a strong self restriction : 36 g/kg of live weight during the « first age »). In trial II, the presence of milk powder in « first age » diets led to higher mean gains (295 g/d versus 224 g/d, $p < 0.01$). However, the diet contained 22.9 p. 100 total crude protein versus 21.4 and 21.7 p. 100, respectively in the milk free diets. Supplementation with lysine led to an intermediate result (248 g/d). These trends were the same at the end of the experiment though the discrepancies were no more significant.

The *feed efficiency* did not change either with the diet or with the class of initial weight (within trials), but it decreased with the age.

In our experimental conditions (healthy piglets, supplemented feeds...), addition of 10 p. 100 skim-milk powder did not improve significantly the mean-term performance. However, this result has to be confirmed by further studies.

Influence of various amino acid deficiencies on piglet feeding behaviour and performance

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Two experiments were made with weaned piglets weighing 10 kg on an average in order to study the influence on the feeding behaviour and performance of deficiencies in essential amino acids : lysine, methionine, threonine, tryptophan, isoleucine.

Eight diets were used. A control diet, E (15.5 p. 100 crude protein) satisfying the requirements for amino acids ; a diet C (12.5 p. 100 crude protein) with amino acid levels

(lysine : 0.85 p. 100 - methionine + cystine : 0.35 p. 100 - threonine : 0.47 p. 100 - tryptophan : 0.11 p. 100 - isoleucine : 0.47 p. 100) exhibiting relative deficiencies as compared with the requirements; a diet CE of the same composition as the previous one, was supplemented with the 5 amino acids so as to obtain the same levels than in the control diet. Five diets were supplemented with 4 amino acids so that each one exhibited only one deficiency : in lysine (CL), in sulphur amino acids (CM), in threonine (CT), in tryptophan (CR) or in isoleucine (CI).

In the first experiment (A) piglets were fed one of the 8 diets. As compared to the control diet E, diets CR, CI and CE led to an increase in the feed conversion ratio of 7 to 8 p.100, this increase reached 20 p. 100 with diets C, CL and CT.

Feed consumption was quite differently affected by the various deficiencies. It was slightly or not affected by deficiencies in lysine (CL), methionine (CM), threonine (CT) or non essential amino acids (CE). It was reduced by 9, 10 and 13 p. 100, respectively with diets C, CI and CR. These results showed the privileged influence of tryptophan and isoleucine deficiencies on feed intake.

When piglets could choose between the balanced diet E and one of the others (experiment B) they always consumed more of the first diet. The most marked differences were obtained with diet CI (isoleucine deficient) whose level of feed intake only represented 25 p. 100 of the total feed intake, and particularly with diet CR (tryptophan deficient) : only 15 p. 100 of the total feed intake.

Influence of sugar incorporation in a soybean-maize 2nd age diet for weaned piglets

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The purpose of this trial was to compare three 2nd age diets of the soybean-maize type including 0, 4 and 8 p. 100 sugar (sucrose) and given in the form of pellets (2.5 mm diameter).

The piglets weaned at 27 days on an average were fed for two weeks the 1st age diet that they received before weaning, then for 28 days one or the other of the experimental diets *ad libitum*. Their mean weight changed from 10 to 25 kg. A total of 360 piglets was used, i.e. 120 piglets per diet.

On the whole, the differences between the three diets were small :

- the level of feed intake increased slightly with the 8 p. 100 diet (+ 4.7 p. 100), while the 4 p. 100 diet was not better consumed than the control diet without sugar ;
- growth rates were similar for the three diets with a slight advantage (+ 2 p. 100) for the sugar diets :
- the feed conversion ratio of the 4 p. 100 diet was comparable to that of the control diet. While the 8 p. 100 diet resulted in a slight deterioration of the feed conversion ratio (+ 2.3 p. 100).

Addition of sugar did not lead to a noticeable improvement of the performance. Therefore it is not interesting for a second age diet as far as it increases the costs.