

The optimal level of balanced protein for growth in females between 20 and 50 kg body weight could not be determined due to a linear straight relationship between growth performance and protein level, after supplementation with lysine (13 and 15 p. 100 protein). Any way it may be excepted that this level is slightly higher than that observed with castrated males. An experiment is conducted for further information.

**Digestibility of amino acids in the pig.
Comparison of two methods of determination used
in the case of wheat and barley**

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The apparent digestibility of crude protein and the different amino-acids of two cereals (wheat and barley, 97 p. 100 in the diet) was measured in 8 pigs with a mean weight of 49 kg during an experimental period of 10 days. In this trial where the intake level was the same for both cereals (1438 g dry matter/day) the apparent digestibility of crude protein was higher for wheat (88 p. 100) than for barley (76.1 p. 100).

Arginine, histidine, glutamic acid or proline showed a higher apparent digestibility than nitrogen. On the contrary the apparent digestibility of threonine, valine, alanine, aspartic acid and particularly lysine was lower than that of nitrogen (the ADC of lysine was 76.2 p. 100 for wheat and 61.95 p. 100 for barley).

The previous results were confirmed by calculation of the true digestibility taking into account the composition of the endogenous faecal nitrogen after feeding of a protein free diet.

The results of the balance trials were compared with the absorption coefficients of the different amino-acids, calculated after a protein intake of 100 g from recordings in the portal vein of the amounts of aminoacids absorbed during a post-prandial period of 8 hours. This method also showed that the digestion of wheat is more rapid and efficient than that of barley (absorption coefficients = 60.1 p. 100 versus 39.5 p. 100) but a certain number of differences appeared when it was compared with the balance method principally based on non essential nitrogen.

**Obtention and composition of rich protein wheat
and its utilization by bacon pigs**

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Wheat represents an excellent source of starch for bacon pigs and can be used without any physiological restrictions (CASTAING and LEUILLET, 1973). Diets based exclusively on a current wheat variety supply already 50 p. 100 of the proteins and 30 p. 100 of the lysine. Thus, use of rich protein varieties should lead to larger soybean savings.

Only few studies except those of BRETTE and LOUGNON (1969) have been devoted to the feeding of pigs with rich protein wheat. The wheat used by these authors belonged to the spring variety « Sonora 64 » containing 200 g protein/kg dry matter. Because of the positive results obtained we decided to examine how to obtain rich protein wheat with the highest yielding winter varieties, especially those unfitted for bread making or of poor baking capacity. Parallel to that, some of the wheat lots were used in animal trials. Those concerning bacon pigs will be reported here.

— In the first trial, the formulation of the experimental diets according to the lysine content only, did not lead to a saving of soybean meal, but showed that this type of wheat allowed to obtain the same performances (average daily gain, feed conversion ratio) as those observed with more current wheat varieties and that the carcass quality was improved.

— In the two other trials, use of industrial lysine led to a soybean saving increasing with the protein content of the wheat; thus, lysine appeared to be the first limiting amino acid. In the third trial performed with a particularly rich wheat (17.4 p. 100 protein in the dry matter) one of the diets used contained only wheat, supplemented with lysine and a vitamin-mineral mixture. The performances obtained were highly variable (average daily gain, 671 g; feed conversion ratio 3.20 kg feed/kg gain). This is naturally an extreme case, but this experiment clearly shows that it is possible to valorize rich protein wheat and to save soybean meal.

Digestibility of horse-beans containing tannins or not by the growing pig

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A study was carried out on 12 castrated male pigs of 25 kg mean weight kept in metabolism crates in order to compare the apparent digestibility and metabolic utilization of two horse-bean varieties, the Rovasse horse-beans and a variety poor in tannins, to that of the soybean meal 44. These feeds constituted the only nitrogen sources and were incorporated into semi-purified diets as replacers of variable proportions of maize starch so as to obtain the same crude protein contents. Moreover the soybean and horse-bean diets were supplemented with 0.05 p. 100 and 0.15 p. 100 DL-methionine, respectively.

These varieties of horse-beans differ mainly in their tannin contents (317.3 mg for 10 g teguments in the Rovasse variety versus 6.1 mg in the other one), and secondarily in their true cellulose contents (10.94 p. 100 dry matter in the Rovasse variety versus 9.8 p. 100 in the other one).

The apparent digestibility of crude protein was lower in the animals fed the Rovasse horse-beans (77.1 p. 100 versus 88.6 p. 100 for the soybean meal). The replacement of horse-beans rich in tannins by horse-beans poor in tannins improved by 8 points the apparent digestibility of crude protein. The metabolic utilization of the nitrogen ingested was lower with diets containing horse-beans as compared to soybean meal.

The apparent digestibilities of the amino acids of the three nitrogen sources were estimated and it appeared that the digestibilities of arginine, histidine and glutamic acid were higher than that of nitrogen. On the contrary, threonine, valine, isoleucine, alanine and glycine had a lower digestibility.
