

Rapeseed « OO » associated to wheat or maize in the bacon pig feeding

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In order to determine whether the effect of incorporating low glucosinolate rapeseed meal (LGRM) into diets for growing-finishing pigs (25-103 kg) depended or not on the basal cereal used, four diets were compared : two maize-based diets and two wheat-based diets containing 0 or 12 p. 100 LGRM. All the diets included 25 p. 100 spring peas and more or less soyabean meal so as to provide 2.65 g/1 000 kcal DE. The maize and wheat diets supplemented with peas and rapeseed meal contained 3.0 and 0 p. 100 soyabean meal, respectively.

Feed intake corresponded to the feed restriction plan. No interaction between the cereal (maize or wheat) and rapeseed meal (0 or 12 p. 100) was observed on the main characteristics of growth and carcasses. The four diets led to almost the same growth rate (687, 682, 688 and 704 g/d, respectively). Feed conversion ratios were similar (3.27 ; 3.39 ; 3.35 and 3.36). A slight reduction in the carcass yield was observed with diets containing rapeseed meal (77.5 ; 77.4 ; 77.5 and 77.2 p. 100). Carcass composition was almost equivalent with the four diets (the loin/backfat ratio was 3.77 ; 4.09 ; 3.34 and 3.49, respectively). The muscle percentage was slightly higher with diets including rapeseed meal and with maize-based diets.

Thus, incorporation of LGRM has an effect independent of the cereal used, at least up to 12 p. 100 and when nitrogen supply is sufficient. In practice, the association peas-LGRM can totally replace soyabean meal.

Prediction of the energy value of sunflower oilmeals from cell wall content

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Two digestibility experiments were made successively to determine the nutritive value of sunflower oilmeals for the pig. In *the first experiment*, several types of oilmeals prepared with sunflower seeds of the same origin were compared : a normal oilmeal issued from whole seeds, two dehulled « type 40 » oilmeals obtained by two processing methods and one oilmeal made of pure sunflower kernels. All the experimental diets were based on wheat. Normal oilmeal was tested at two levels of incorporation : 10 and 20 p. 100, whereas the dehulled and pure kernel oilmeals were incorporated into the diets only at the level of 20 p. 100. In *the second experiment*, the control diet was also based on wheat (group 1), the experimental diets included 20 p. 100 pure kernel oilmeal (groups 3, 4 and 5) admixed or not (group 2) with increasing proportions of sunflower hulls in order to reconstitute a dehulled « type 40 » (group 3) oilmeal, a normal oilmeal (group 4) and a high fibrous oilmeal (group 5).

The experiment involved 44 *Large White* castrated male pigs with a mean liveweight of 37.5 kg kept in individual pens specially fitted for digestive balance. After an adaptation period, excreta (faeces and urine) were collected for 10 consecutive days.

The matrix of simple correlations showed that the energy value (DE) of oilmeals highly depended ($r = -0.96$) on their cell wall (CW) content. The same holds true for the other parameters highly correlated with the latter, like proteins. Equations of similar accuracy

were obtained when using the different CW criteria (crude fibre, ADF, NDF, AD lignine) which were highly correlated with each other. In particular, DE varied curvilinearly with the level of crude fibre according to the relation :

$$\text{DE (kcal/g DM)} = 4\,027 + 13.4 \text{ CF (\% DM)} - 2.5 \text{ CF}^2$$

($R^2 = 0.972$; $\text{RSD} = 149$; $\text{RSD \%} = 4.7$)

This study emphasized the interest of dehulling to improve the energy value of oilmeals. Our results enable to correct easily the digestible energy content of oilmeals from their crude fibre content.

Utilization of different varieties of peas and of a spring peas-field beans association by the bacon pig

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In a *first trial* three diets containing about 30 p. 100 peas of different varieties were compared to a control diet without peas. The three varieties tested were a spring variety (*Amino*) and two winter varieties *Vendevil* and *Frisson*. All of them exhibited a low trypsin inhibitor content (4.4 ; 6.5 and 10.9 TUI/mg DM).

The diet including the *Amino* variety led to the same fattening performance as the control diet. This confirms our previous results and shows that it is possible to incorporate 30 p. 100 peas into bacon pig diets. The diet including the *Frisson* variety led to lower performance than the *Amino*-based diet. This confirms the results of the previously made comparison between spring and winter varieties. The diet including the *Vendevil* variety led to performance half between those obtained with *Amino* and *Frisson* diets. This confirms our hypothesis on the role of trypsin inhibitors on the performance reduction in pigs fed diets with high levels of winter peas. Accordingly, *further studies should be made by plant breeders so as to reduce the trypsin inhibitor content of winter peas.*

Two other trials were made to compare a wheat-based control diet, a diet with 25 p. 100 winter peas (*Amino* variety with 4.2 TUI/mg DM), a diet with 10 p. 100 field beans (*Alfred* variety with 4.5 p. 100 TUI/mg DM), and a diet including field beans and peas at the same level of incorporation.

The diets including both 25 p. 100 peas and 10 p. 100 field beans led to similar performance as the control diets. Both trials showed that it was possible to associate peas with field beans. They also showed that the first limiting factor of winter peas is a deficiency in secondary amino acids.

Effect of lysine supplementation and reduction of protein level on growth performance of pigs fed maize or wheat based diets

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The effect of a reduction in the dietary protein level after supplementation with L-lysine HCl on growth performance and carcass characteristics was studied in an experiment involving 144 *Large White* pigs between 27 and 100 kg live weight. Four treatments were compared in 3 groups of 6 animals of both sexes (females, castrated males). They were fed diets based on maize or wheat, in combination with soyabean meal, at two protein levels