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Comparison of different types of barley with variable crude fibre contents in growing-finishing pig diets

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Two trials (A and B) were made with 98 and 96 fattening pigs, respectively, kept in individual pens to compare several types of barley with variable contents of crude fibre components under the same conditions of protein and energy supply.

A total of 7 batches of barley were compared in both trials : a naked barley, a spring barley, a two-row winter barley and two six-row winter barleys with a crude fibre content ranging from 1.9 to 6.6 p. 100 DM. Six batches of barley were compared in trial A (I.N.R.A.) and three batches of regular barley in trial B (I.T.C.F.). In each experiment the diets based on barley were compared to a control diet (maize-soybean meal). Several batches of raw materials were common to both trials.

In order to use the same energy restriction plan for all the animals we took into account the respective digestible energy values of the different kinds of barley measured in five of them during a previous digestibility study or estimated on the basis of their Weende crude fibre content according to the equation $Y = 4\ 072 - 110 X$ established during the same study (PEREZ *et al.*, 1980).

A single diet was offered in each treatment to females and castrated males and over the whole fattening period. All the diets exhibited the same lysine/energy ratio (2.5 g/Mcal ED).

The same trend were observed in both trials, but performances were slightly higher in trial B. For the same theoretical digestible energy supply were obtained very similar growth performance and carcass qualities with the different diets. The energy conversion ratios (Mcal ED/kg weight gain) were equivalent whatever the nature of the barley, showing that the energy value of the different barleys were properly adjusted.

Animal fat enrichment of diets based on barley in piglets and bacon pigs

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Two experiments were made in young piglets of 8.4 to 23.3 kg and in bacon pigs of 23.8 to 104.2 kg to study the effect of an increase in the energy concentration of diets based on barley and soybean meal through the incorporation of animal fat.

In weaned piglets introduction of 3.5 points animal fat led to a marked improvement (4.6 p. 100) in the feed conversion ratio on the other hand, with 7 points fat the supplementary improvement of the ratio was too small (lower than 2 p. 100). In both cases growth was not modified.

In the bacon pig, introduction of 3 to 6 p. 100 animal fat resulted in our experimental conditions in a slight improvement of the growth rate.

At the first level of fat incorporation (3 points), the feed conversion ratio was remarkably improved by 8.5 p. 100. The body composition was not modified.

At the second level of fat incorporation (6 points) the significant improvement in feed conversion ratio was only 4.3 p. 100 as compared to the first level. The ratio was then close to that obtained with maize.

The body composition was poorer, the fat deposition increasing with the rise in the dietary fat content — at that level the pigs were not able any more to valorize the fat.

In terms of quality, the composition of the fat depots was rather similar from one diet to another. With 6 p. 100 animal fat in the diet, the fat deposited was less saturated. Hence, it may be assumed that with a high fat supply and a restricted feeding, pigs use preferentially saturated fatty acids to satisfy their energy requirement while they deposit unsaturated fatty acids.

Nutritional value of triticale for pigs : comparison with wheat, rye and protein-rich maize

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The energy and protein value of different lots of triticale was estimated in growing pigs during two digestibility trials :

— in trial 1, a variety of triticale (13.4 p. 100 T.C.P./D.M.) was compared with a feeding wheat of the *Mary Huntsman* variety (14.8 p. 100 T.C.P./D.M.) ;

— in trial 2, two varieties of triticale (532-4 and CLERCAL-43) with a low T.C.P. content (10.1 p. 100 D.M.) were compared with rye (9.0 p. 100 T.C.P./D.M.) and with a sample of protein-rich maize (12.0 T.C.P./D.M.).

Eight castrated male pigs with a mean live weight of 31.5 kg (trial 1) and 16 castrated male pigs with a mean live weight of 31.2 kg (trial 2) were distributed into groups of 4 pigs per experimental diet and housed in individual pens. They received simplified diets only based on cereal (97 p. 100). Total faecal collection was made during 10 consecutive days.

With a rather steady gross energy content (4 334 kcal/kg D.M.), the mean energy value of triticale for pigs was 3 725 kcal D.E./kg D.M. (ranging from 3 617 to 3 803 kcal), i.e. a value located between that of rye (3 650 kcal) and that of wheat (3 850 kcal). Its mean apparent digestibility coefficient (86 p. 100) close to that of maize (86 to 87 p. 100) was also located between that of rye (85 p. 100) and that of wheat (87 to 88 p. 100).

The mean protein digestibility coefficient of triticale (78.7 p. 100), close to that of maize (79 p. 100), was also located between that of rye (70 p. 100) and that of wheat (85.5 p. 100).

Except the advantage of a 15 p. 100 increase in its protein content (12 p. 100 versus 10.4 p. 100), the nutritional characteristics of maize BRUEX H.T.V. 216, were similar to those of normal maize : 3 950 kcal D.E./kg D.M., apparent digestibility coefficient of energy and protein of 86 p. 100 and 79.7 p. 100, respectively.