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# **Processing technology of early weaning feeds for piglets: influence of the physical form (meal or pellets) and the pelleting conditions on the utilization of diets based on barley or maize**

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— In the first trial involving 86 piglets per treatment, diets containing 18 and 20 p. 100 crude protein, with and without fish meal, were used. The weight and mean age of the piglets at the beginning and at the end of the trial were the following: 9 kg at the age of 38 days and 28 kg at 73 days.

— In the second trial involving 144 piglets per treatment, a diet including 20 p. 100 crude protein with and without fish meal was used. The weight and mean age of the animals at the beginning and at the end of the trial were the following: 9 kg at 38 days and 24 kg at 66 days.

The experimental device applied was that of the batch system. For establishing the experimental groups, the animals were chosen according to their weight at weaning and average litter weight at birth. They were weighed individually. After having established the groups (weaning) the animals were fed the starter diet *ad libitum* in the post-weaning room (flat-decks) where after they received the experimental diets *ad libitum* till the end of the experiment. The feed intake was recorded per group of piglets (6-7 animals per box).

In the two trials, there was no significant difference between the treatments as for the feed intake levels which amounted to about 1 kg/day/piglet.

The results of the two trials show that for a given crude protein level, the addition of fish meal to the diet did not significantly affect either the growth or the feed conversion ratio.

The great statistical value of the experiment involving 642 piglets would most likely have evidenced a 5 p. 100 difference of growth and feed conversion ratio between the groups, if such a difference had existed.

It may therefore be assumed that when the rearing conditions permit to obtain high performances in the weaned piglets (more than 500 g/day), an increase in the productivity depends most likely on an increase in the supply of crude protein, the advantage of using fish meal, even of good quality, being illusory.

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### Processing technology of early weaning feeds for piglets: influence of the physical form (meal or pellets) and the pelleting conditions on the utilization of diets based on barley or maize

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Three hundred sixty piglets were used to study the influence of the physical form of the feed (*meal*, pellets obtained by *dry* or *steam pelleting*) on the performance of the piglets after weaning. The possible interactions with the kind of cereal used (*barley* or *maize*), the initial weight of the animals (« light » and « heavy » at weaning) and their age (1st and 2nd age feeding) were also investigated. Pre starter and starter feeds were isonitrogenous and iso-lysine. The pressing conditions of the pellets, the particle size of the initial meal, the variation in the inlet-outlet temperature of the die, the rate per hour of the press as well as the final technological characteristics of the pellets, were described. Use of steam resulted in a harder, more durable pellet and a higher rate per hour of the press than the dry treatment. It was not possible in any case to establish a relationship between hardness measures and *feed intake level*. However the intake of pellets including barley was lower (— 12 p. 100) than that of the corresponding meal. The *growth rate* of the piglets was little affected by the physical form of the feeds based on barley, whereas an 8 p. 100 improvement was observed with the dry pelleting of feeds based on maize. The pressing treatment affected in particular the *feed efficiency*, the effects (+ 19 to + 23 p. 100) being more marked in the young piglets (from the age of 20-25 days, with the 1st age feed) and light ones (5.1 to 5.4 kg). On the basis of the whole experimental period, dry pelleting appeared to be more advantageous (+ 15 and 11 p. 100, respectively with barley and maize) than steam pressing (+ 8 and + 6 p. 100). Likewise, the cereal which was the least efficient in form of meal (barley) was the best valorized by pelleting. The efficiency of the diets based on maize was 7 p. 100 higher than that of the diets based on barley probably because of a higher

digestible energy concentration. However, this effect only appeared during the 2nd age period, barley being as efficient as maize immediately after weaning (1st age feed).

Pelleting of weaning feeds improving the feed efficiency also reduced the frequency of diarrhoea and therefore seemed to be very favourable in particular for the youngest and lightest animals at weaning.

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### Study of some factors of variation of the digestive transit in pregnant sows (crude fibre level and constipation)

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Use of high energy diets with low crude fibre levels was studied in pregnant sows. The experiment showed the existence of:

- a relationship between the crude fibre level and the transit rate owing to the utilization of markers (chromium oxide);
- an increase in the apparent digestibility of the diet after reduction of the cellulose level.

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### Comparative utilization of the three French barley varieties by the growing-finishing pig

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A comparison was made in the bacon pig between three types of barley: spring barley, two-row winter barley and six-row winter barley and an energy rich cereal, *wheat* (trial 1 during the finishing period) as well as *maize* (trial 2 during the growing-finishing period). The cereals were supplemented with soybean meal so that the protein supply be not limiting.

The digestible energy value of the barleys was estimated according to Henry and Bourdon's proposals by taking into account their crude fibre and moisture contents assuming that, in terms of energy, 2.13 points water equal 1 point crude fibre. In each trial the animals received daily the same digestible energy supply, the feed restriction schedule being modulated according to the energy concentration of the diets.

In both trials we obtained comparable growth performances with the different diets, 665 g and 688 g/d, respectively. The energy ratios were also very close whatever the control cereal or the type of barley used, 11.39 Mcal/kg  $\pm$  0.22 and 9.90 Mcal/kg  $\pm$  0.12.

This relative steadiness of the energy ratio confirmed our results and the information from literature. The feed conversion ratios (kg feed/kg live weight gain) increased therefore with the crude fibre content of the barley variety used, the discrepancy between energy cereals and barleys reaching 10 p. 100 on an average at the expense of the latter.

Thus, the correction proposed by Henry and Bourdon seems to be interesting. It is based upon the variation of the energy apparent digestibility coefficient according to the crude fibre level. Thus using as a basis the digestible energy implies a constant gross energy value whatever