

ishment of normal performances (DMG 660 g ; FCR : 2.53), but addition of tryptophan (group 6) appeared not to be necessary. As a matter of fact, tryptophan supplementation alone (group 5) seemed to create an imbalance by excess leading to growth depression (615 g/day) and deterioration of the feed conversion ratio (2.65).

During the finishing period, between 60 and 100 kg live weight, the results obtained did not significantly differ from one treatment to another, but the two best treatments during the growing period (group 2 and 6) also appeared to be the best ones during the finishing period.

As regards the total growing-finishing period, substitution of half of the soyabean protein by blood meal (group 2 versus group 1) improved by 6 p. 100 the growth rate and by 4 p. 100 the feed conversion ratio. Likewise, total replacement of soybean oil-meal by a supply of 12 p. 100 blood meal, supplemented with isoleucine (0.05 p. 100) and tryptophan (0.03 p. 100), improved by 4 p. 100 the growth rate and by 5 p. 100 the feed conversion ratio. With respect to body composition, no difference between the treatments was noticed.

This experiment shows the advantage of using blood meal as protein replacer of soyabean oil-meal for fattening pigs. In terms of French pig production, blood meal (around 50 000 tons), used as a replacer of 50 p. 100 of the supplementary supply of protein, might ensure the fattening of 3 millions of pigs per year

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### Energy value of dried beet-pulps and utilization by the growing-finishing pig

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#### *Energy value*

The study included 12 pigs (castrated *Large White* males) from 28 to 37 kg, divided into 3 groups kept in metabolism crates. Group 1 received a control diet (maize-soyabean) ; groups 2 and 3 were fed with 20 p. 100 dried beet pulps in replacement of the maize soyabean mixture. No differences were recorded in the growth performances (but the period was short and the number of animals small) however 20 p. 100 pulps increased the feed conversion ratio by 3 p. 100. Digestibility decreased linearly when the crude fibre content increased (*i. e.* pulp level). The digestible energy of beet pulp represented 2562 kcal/kg dry matter, the apparent digestibility coefficient of energy being 60.4 p. 100.

#### *Utilization of dried beet-pulps*

The three treatments described above were compared on 30 pigs (10 per treatment) from 26 to 98 kg liveweight. Growth performances were only slightly changed at the level of 10 p. 100 pulps but the daily mean gain decreased by 5 p. 100 and the feed conversion ratio increased by

13 p. 100 at the level of 20 p. 100 pulps ; the carcass quality was markedly improved (smaller fat depot).

In conclusion, it is not advisable to exceed 20 p. 100 dried beet pulps in growing-finishing pig diets.

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### **Utilization of some crude fibre rich raw materials in the feeding of bacon pigs : oat, wheat bran, dried beet pulp**

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In our experimental conditions, the best feed efficiency and the most favourable growth performances have been obtained with diets including highly energetic cereals (maize and wheat) combined with soybean oil-meal. However, in the absence of a rigorous feeding schedule and especially in the case of « pre-fattening », the carcasses obtained exhibited large amounts of subcutaneous depot fats and were penalized by the commercial grading.

Dilution of the energy concentration by bulk feeds has been studied in some trials and the results obtained show the impact of the source of crude fibre or type of cereal used in the diet : maize (MOAL, 1971), wheat (HENRY et BOURDON, 1971) or barley (HENRY *et al.*, 1970).

As most of these trials were made under *semi-ad libitum* feeding conditions, it was decided to repeat them in true *ad libitum* feeding conditions (pre-fattening), using a classical crude fibre source (wheat bran) or a less traditional one (dried beet pulp and oat).

These two trials show that it is not advisable to use crude fibre, at least not under conditions of pre-fattening after 55 kg or *ad libitum* feeding during the whole fattening period. The attempts made to noticeably reduce the fatness of the carcasses did not succeed with the type of pigs available, and the feed intake increased.

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### **Energy value and utilization of two types of barley (regular and hulless) by the growing-finishing pig**

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In order to compare the utilization of two types of barley, regular and hulless, by the growing-finishing pig, two experiments were performed :

— the first experiment was made on 2 groups of 7 castrated male pigs in metabolism crates, at an average body weight of 39 kg, with the aim of measuring the digestible (DE) and corrected metabolisable (ME<sub>n</sub>) energy values of the two types of barley in relation with the level of crude fibre.