

significantly ( $p < 0.01$ ) improved DMG (786 vs 751 g) and CR (2.80 vs 2.89). Whey intake improved DMG (787 vs 750,  $p < 0.01$ ). Improvement of the gain was all the more marked as the feed was pelleted (821 vs 754 g) and the whey intake was low (12.5 vs 17.7 p. 100), as compared to pigs fed the diet in the form of meal (752 vs 748 g) and water only. Increase in the dietary cellulose content led to a significant reduction ( $p < 0.01$ ) in the carcass adiposity and to an increase in muscle quantity in relationship with a decreased growth rate. Feed pelleting and whey supplementation did not affect carcass quality, although an increased flare fat deposition was observed in pigs fed whey.

In a total digestibility trial, 24 pigs were distributed into 6 groups and 4 replicates according to a factorial design  $3 \times 2$ . Three levels (2.5, 4.5 and 6.5 p. 100) of crude fibre (wheat bran) were combined to the absence or presence of whey at a level of 30 p. 100 of dietary DM. The same combination was studied for ileal digestibility in six pigs fitted with an ileo-rectal anastomosis, using a latin square design. The apparent digestibility coefficients (aDC) of all dietary nutrients were significantly reduced ( $p < 0.01$ ) by the increase in the cellulose content: by 4 points for energy for 1 p. 100 crude fibre, but the presence of 30 p. 100 whey also provoked an additional reduction by 4 points. However, significant interactions only occurred between these factors for cell-wall constituents. Digestibility of the lignin-cellulose fraction, and at a lesser extent that of hemicelluloses was lower in cellulose-poor diets than in the others. The difference between total and ileal aDC for each diet was generally positive, except for lipids. However, the magnitude of the difference varied according to the diets: from 4 points for energy with cellulose-poor diets with water up to 13 points for whey-rich diets.

### **Evaluation of wet brewers' yeast in diets for bacon pigs**

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Two trials were made to assess the performance of bacon pigs fed wet brewers' yeast. In both trials, the absence or the presence of yeast was tested. In the first trial, yeasts accounted for 9 p. 100 of DM in a diet including whey and 16 p. 100 in the second one. Each trial involved 160 animals, i.e. 80 animals per treatment. In both trials, the diet was given according to a progressive and continuous feeding scheme until a maximum level of 8,200 Kcal DE for castrated males and 9,300 Kcal for females. A maximum of 1,7 l of yeast was given in the first trial and 2,8 l in the second one.

Incorporation of yeasts improved the fattening performance (growth rate and feed conversion ratio) by 6 p. 100 in the first trial and 8 p. 100 in the second one as well in females as in castrated males.

It was concluded that steam-killed wet brewers' yeast with a minimum dry matter content of 130 g/l may supply 50 p. 100 of protein supplementation.

### **Monosodium glutamate supplementation of pig starters**

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In intensive management conditions, it is recommended to give starter feeds to piglets from the first days of age in order to improve post-weaning performance. Palatability of the starter feed is important to insure adequate consumption of the required nutrients. The monosodium glutamate

(MSG) currently used in human feeding as flavouring agent and/or flavour enhancer has been shown to improve the palatability of diets for piglets and calves. However, these trials have been made in free-choice feeding conditions. In order to confirm these results with a single feed, we compared a conventional starter to the same diet supplemented with 0.5 p. 100 MSG.

This trial involved 10 consecutive batches, i.e. a total of 120 litters of 10 suckled piglets and 7 consecutive batches, i.e. 84 pens of 7 weaned piglets. Feeds were fed ad libitum as pellets.

During suckling, MSG improved feed intake by 35 p. 100 as compared to the control diet without modifying daily weight gain. The difference was highly significant and even reached 53 p. 100 between 18 days of age and weaning. After weaning, MSG incorporation increased feed intake (+ 10.3 p. 100) and daily weight gain (+ 6.7 p. 100). The effect of MSG was more marked in piglets exhibiting a small or mean live weight at weaning (feed intake + 15 p. 100 and DMG + 10 p. 100). By contrast, this effect was not observed in piglets with a live weight at weaning exceeding 8.3 kg.

### **Effect of different dietary energy contents on the performance of growing-finishing pigs**

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Two trials were made in restricted feeding conditions to study the effect of energy concentration on the performance of growing-finishing pigs. Four diets maize — winter barley — soyabean meal — fat and bran were formulated so as to supply 2,900-3,100-3,300 and 3,500 Kcal DE/kg (estimated by the additive method).

In the first trial, the three high energy diets were ingested somewhat as expected by the feeding scheme. Digestible energy intakes were similar. Energy was used with about the same efficiency since daily gains differed by less than 1.1 p. 100. Thus, feed conversion ratios reflected the differences in the energy concentration. Feed intake was slightly lower (– 1.3 p. 100) with the low energy diet and the energy was much less well used for growth (feed conversion ratio 5.6 p. 100 higher than that of the first two diets) and thus, weight gain was about 7 p. 100 lower. Carcass yield was not affected by the energy concentration except with the low energy diet. Fat deposition was slightly higher with the two higher energy diets.

In the second trial, digestible energy intakes were similar with the four diets. This energy tended to be less well used for growth as the dietary energy concentration decreased. Carcass yield increased with the dietary energy concentration except with the lower energy diet. Carcass qualities were similar, but fat deposition tended to be lower with diets of medium energy concentration as compared to the other two regimens.