live weight, distributed into 4 groups, 1) a control standard diet, 2) diet RB, without lactose, 3) RB + lactose powder, 4) RB + hydrolysed lactose syrup. The amount of lactose in groups 3 and 4 represented 50 p. 100 of the daily dry matter intake. The chemical compositions of diets 1, 3 and 4 were quite similar apart from the crude energy level which was 100 Kcal/kg lower in diets 3 and 4. The apparent digestibility of energy was not statistically different for the 3 diets, i.e. 83.7, 80.3 and 84.5 p. 100, respectively, but that of protein was lower in group 3 (75.4 as compared to 85.5 and 87.9 in groups 1 and 4, respectively). The digestible energy content was significantly lower in diet 3 as compared to diets 1 and 4. On the other hand, the metabolisable energy level was lower in diet 4 as compared to the two others. The energy content of lactose was calculated on the basis of the energy values of diet RB in group 2 : lactose powder DE = 3 078 ± 141 ; ME = 2 895± 106 ; hydrolysed lactose syrup : DE = 3 608 ± 75 ; ME = 2 806 ± 99. Thus the advantage of hydrolysis is annihilated by the urinary excretion of galactose representing 19 p. 100 of the ingested galactose. Accordingly, these energy values are only valid for an incorporation level of 50 p. 100 of the diet dry matter as the excretion decreases with this level.

The second experiment was made with 56 castrated males and females weighing 57 kg on an average, distributed into 4 groups and fed the same diet as the previous ones, i.e. diet 1 in group A, 3 in group B, 4 in group C and diets 1, 3 and 4 alternatively by periods of 14 days, in group D. Until 107 kg live weight, growth rates of groups B, C and D receiving lactose (hydrolysed or not), were significantly lower than that of group A, but similar for the three groups. Alternating diets 1, 3 and 4 did not significantly change the growth rates in spite of more days with diarrhoea when diet 3 was offered. At that stage, 3 animals of each sex were slaughtered in each group. Lactose, hydrolysed or not, led to a reduction of the slaughter yield ; the increase in lean percentage was not significant. The last 4 males were fattened for a mean period of 129 days during which a non significant difference was observed in the growth rate, i.e. 603 g/d in group C and 693 g/d in group A. The lean contents were similar. The last 4 females were inseminated. Two were not fertilized, one in group C and one in group D. They were sacrificed between day 110 and 113 of gestation. The live weight gains of the sows fed with lactose were not significantly different the one from the others, but they were lower than that of the control group. The gestation net gains or number of foetuses were not different either between the different groups. However, the small number of sows used does not allow us to generalize the results. Cataract was observed in two sows of group C and in 2 of their foetuses.

## Effects of high protein and lysine levels for the supplementation of whey in growing-finishing pig diets

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A total of 48 *Large White* pigs (castrated males and females) with a mean live weight of 24 kg were distributed into 4 groups and fed diets including liquid hard cheese whey in increasing amounts with age (20 to 40 p. 100 of the dry matter). Using current raw materials, the least expensive feed supplements (different for each group) were used according to a factorial combination of 2 crude protein levels and 2 total lysine levels. In the final diets (whey + feed supplement) the protein levels ranged from 17.0 to

18.5 p. 100 of the DM during the growing period (up to 58 kg) and from 14.1 to 15.8 p. 100 during the finishing period (up to 102 kg). The lysine levels varied similarly between 0.95 and 1.06 p. 100, then between 0.75 and 0.83 p. 100. No significant interaction was observed between the effects of protein and those of lysine on performance or on carcass yield. During the growing period, the increased lysine supply from 2.77 to 3.16 g/1 000 Kcal DE led to a highly significant improvement of the daily mean gain (683 to 712 g/d) and of the feed conversion ratio (2.13 to 2.05 for DM and 7.19 to 6.86 Mcal for DE). Opposite to that, the protein level did not affect the performance. During the finishing period, the minimum protein and lysine levels were sufficient to obtain the maximum growth rate of 760 g/d fixed by the feed restriction plan, i.e. : 1 850 g feed supplement and 16 l whey. During the growing and the finishing period no difference was observed between males and females. However, this difference was highly significant as regards the carcass characteristics : females exhibited a lean and bone percentage of 53.6 p. 100 versus 51.5 p. 100 in males, and a fat percentage of 38 p. 100 versus 40.4 p. 100. Lysine significantly increased the ham weight (+ 500 g), while the highest protein levels increased the lean percentage (52.1 to 53.0 p. 100). Increase in the protein and lysine levels had a beneficial effect on meat quality. The highest lysine levels led to a water loss reduction.

## Effect of skim milk powder in weaning diets for piglets
## Role of the dietary protein level

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Six trials were made in 580 piglets weaned at three weeks to test the effect of the incorporation of skim milk powder in two diets containing 18 and 22 p. 100 crude protein, respectively. The diets were offered *ad libitum* in the form of pellets during the first fortnight following weaning (1st age). Whatever the diet, the feed intake and live weight gain tended to increase with the initial weight at weaning. However, this did not improve systematically the feed efficiency. There was no significant relationship between the effects of milk powder and those of the crude protein content. The incorporation of skim milk powder did not modify the feed intake, but improved significantly the live weight gains as well during the first age as during the whole experimental period (+ 5 p. 100). The feed efficiency was also improved by 5 p. 100. The increase in the crude protein content of the diet had a favourable effect on the daily weight gain and feed efficiency which was as marked as that of the milk powder, but it did not affect the feed intake.

## Long-term effects of reducing the protein level in a simplified weaning diet for piglets

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A total of 180 piglets from 30 litters weaned between the age of 19 and 25 days were reared individually from weaning to slaughter. Six 1st age diets were compared