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Effects of feeding gilts with normal or low glucosinolate rapeseed meal on reproductive performance

M. Etienne, Jean-Yves Dourmad

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Sow prolificacy and piglet survival were not affected by the pregnancy diet. In contrast, the mean live weight of piglets was higher in the control group than in the other ones, especially at weaning (on an average for the two cycles : 5.5, 5.0, 4.7 and 4.8 kg in the control, barley, wheat and maize groups, respectively) and at 35 days of age (7.5, 6.3, 6.4 and 6.3 kg). Feeding diets containing 96 % cereals during pregnancy reduced the development of body reserves and affected milk production during lactation. These effects particularly marked with maize may be attributed to the lysine deficiency of cereals.

Estimation of changes in the sow body composition during pregnancy showed that the lower gain of sows fed the experimental diets were due to a lower muscle gain, especially in the maize group, whereas fat deposition was not affected. On the other hand, the pregnancy weight gain decrease between the 1st and the 2nd cycle whatever the diet (mean difference between the first and second pregnancy : 8 kg for total weight gain and 9 kg for net weight gain) was due to a lower fat deposition. It is explained by higher energy maintenance requirements of heavier animals. Therefore, energy requirements during pregnancy increase with parity number.

Utilization of spring peas by the sow during pregnancy and lactation

F. GATEL, G. BURON, M. LEUILLET

I.T.C.F., 8, avenue du Président-Wilson, 75116 Paris

Utilization of spring peas (*Pisum sativum*) of the variety « Amino » was tested in 137 sows totalizing 536 litters distributed over 7 cycles. Control animals were fed diets without peas including cereals, soybean meal, bran and fish meal. They were compared to animals fed a diet including 16 % peas during pregnancy and 24 % during lactation (peas replacing cereals and soybean meal).

Diets including peas were well ingested. Net pregnancy weight gain was similar whatever the diet, whereas weight losses during lactation were 6 % higher in the pea-fed group. Weight change of sows was similar with the two dietary treatments. On an average, there was no difference in prolificacy between the two groups of animals. Birth weight and mortality of suckled piglets were similar in both groups. Growth rate of suckled piglets was slightly higher with pea-based diets (216 versus 210 g/day). Culling rate was similar in both groups. It was concluded that the incorporation of 16 and 24 % spring peas into gestation and lactation diets did not affect the reproductive performance or life of sows.

Effects of feeding gilts with normal or low glucosinolate rapeseed meal on reproductive performance

M. ETIENNE, J.Y. DOURMAD

INRA, Station de Recherches Porcines, Saint-Gilles, 35590 L'Hermitage

Effects of feeding normal (cv. Jet Neuf) or low glucosinolate (cv. Tandem) winter rapeseed meal on reproductive performance were investigated in 107 Large White gilts. After mating, females were fed diets with 13.5 % soyabean meal (control group) or 20 % Jet Neuf (Jet Neuf group) or Tandem (Tandem group) rapeseed meal as sole protein concentrate. During a 3-week lactation, half the control gilts were fed the Jet Neuf diet and half the Jet Neuf and Tandem groups were fed the control diet. The other animals received the same diet as during pregnancy. Daily feed intake was 2.3 kg in pregnancy and 4 kg in lactation. All gilts were laparotomized 40 days post-mating to measure embryonic mortality. Eight gilts per group were slaughtered at 111 days of gestation. Thyroids of the dams and of their foetuses were weighed. Thyroid weight was also measured in three piglets per litter sacrificed at weaning.

Feeding diets containing 20 % normal rapeseed meal increased by 65 % the thyroid weight of gilts. This gland was not affected in the Tandem group. Thyroid hypertrophy was much more

pronounced in foetuses : its weight was increased by 2.2 in the Jet Neuf group ($P < 0.001$) and by 1.4 (NS) in the Tandem group. This criterion was not affected by the lactation diet, whereas the effects of the pregnancy diet persisted in piglets at weaning. It was concluded that foetal thyroids are particularly sensitive to goitrogenic compounds of normal rapeseed meal.

Feeding pregnant gilts with normal or low glucosinolate rapeseed meal increased early embryonic mortality ($P < 0.001$; 47.3, 40.1 and 29.1 % in the Jet Neuf, Tandem and control groups, respectively). Likewise, total embryonic mortality was higher (19.4, 44.1 and 31.4 %, respectively), but mortality after 40 days of gestation was not affected. Prolificacy of gilts fed rapeseed meal was therefore lower ($P < 0.01$; 10.7, 8.5 and 9.1 total piglets born in the control, Jet Neuf and Tandem groups, respectively). Increased embryonic mortality mainly concerned some gilts and did not seem to be related to the goitrogenic properties of rapeseed meal. Postnatal piglet mortality tended to be higher in litters from dams fed normal rapeseed meal during pregnancy (30.2 % in the Jet Neuf vs, 18.3 % in the Tandem and 19.8 % in the control groups).

In our experimental conditions, feeding diets containing 20 % rapeseed meal to lactating gilts had no effect on reproductive performance. Using low glucosinolate rapeseed meal minimized the goitrogenic effects of normal rapeseed meal. Reasons for increased embryonic mortality due to rapeseed meal intake should be investigated.

Comparison of three levels of dietary lysine in the bacon pig Influence of the genotype

F. GATEL, F. GROSJEAN

I.T.C.F., 8, avenue du Président-Wilson, 75116 Paris

A trial was made in 48 Large White and 48 Pen ar Lan females kept and fed individually between 30 and 100 kg live-weight to compare three dietary treatments exhibiting a different lysine content (2.6, 2.8 and 3.2 g/1 000 kcal DE). The diets consisted of 58.3 % wheat, 20.0 % barley, 18.2 % soyabean meal and 0, 0.12 or 0.24 % lysine HCL and were offered according to the same feeding pattern.

Whatever the period, feed intake was similar with the three treatments and in the two breeds. Between 40 and 60 kg live-weight, feed conversion ratio was improved when the level of dietary lysine was higher (2.67, 2.62, 2.57 in Large White and 2.75, 2.60, 2.61 in Pen ar Lan females). During the finishing period (60-101 kg), feed conversion ratios were not significantly different (3.16, 3.19, 3.20, 3.12, 3.08, 3.14). When considering the whole fattening period (40-101 kg), the differences observed in feed conversion ratios were no more significant (3.00, 3.00, 2.99 in Large White and 3.00, 2.93 and 2.94 in Pen ar Lan females). Carcass yield was neither affected by the diet nor by the breed. Muscle percentage was influenced by the breed but not by the level of lysine (50.0, 51.5, 51.8 ; 54.0, 53.9 and 54.4 %). Likewise, the technological quality of hams was dependent of the genotype but was not affected by the diet. It was concluded that the level of 2.6 g of lysine/1 000 kcal DE is recommended in growing-finishing pigs whatever the breed.

Influence of sex and castration on the response of growing pigs to dietary lysine concentration

J. LOUGNON, T. KIENER

A.E.C., Service Développement Alimentation Animale, 03600 Commentry

The responses of entire male, castrated male and female growing pigs to dietary lysine concentration was investigated in an experiment involving 144 animals.