

**ALIMENTATION — FEEDING****Biological efficiency of vitamin A in the young pig : dynamics of hepatic storage**

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Vitamins are microelements which do not play a critical role in animal feed formulation, mainly because of their commercial availability in the synthetic form at relatively low prices (the cost of vitamin A in a feed supplemented to 10,000 IU/kg is about 30 centimes per 100 kg). Although real vitamin deficiencies are now overcome, the economic consequences of slight undersupply are not well known.

Two experiments were carried out at the AEC experimental farm to study the hepatic storage of vitamin A in piglets.

The first methodological study enabled to determine the dynamics of hepatic storage of vitamin A in the piglet and to appreciate the hierarchy of depletion. In the second experiment, lobe 3 of the middle lobe was chosen to study the hepatic storage of vitamin A according to the source and dosis.

Supplementation of synthetic vitamin A improved the performance of piglets up to 5 IU/g of diet and led to a linear increase in hepatic storage between 5 and 20 IU/g of diet.

The amount of vitamin A required to stabilise hepatic reserves to the level of 200 IU/g on the conditions of our experiment was 10 IU/g of feed. This value is thus recommended in the formulation of pig diets.

**Enhancement of phytate P utilization in growing pigs using diets including high phytase activity by-products : Wheat or rye bran**Annie FOURDIN, Pierrette CAMUS, B. CAYRON,  
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Some cereal by-products, like bran, exhibit a high phytase activity, which may enhance phytic P digestibility. This was studied in growing pigs given phytate-rich diets containing either wheat (WB) or rye (RB)-bran. Two trials involving 12 animals each (6 treated, 6 controls) were carried out, one (WB trial) with a 15 p. 100 fine WB diet and the other (RB trial), a 20 p. 100 fine RB diet and their respective controls (WC and RC). The four diets (WB, RB, WC and RC) contained the same amounts of energy, protein, Ca (0.7 p. 100) and P (0.4 p. 100) and no organic P was added. Pigs were fed these diets for 3 (WB trial) or 8 weeks (RB trial) during which 10-day balance studies were performed. Then animals were slaughtered and bone samples collected.

WB, WC and RC, in contrast to RB-fed pigs developed a P-deficiency as indicated by hypophosphatemia, hypophosphaturia, hyperhydroxyprolynuria and hypercalcemia. P from RB diet was better adsorbed (55 p. 100) and retained than that of the control diet (36 p. 100), but this « bran effect » was absent with the WB diet (37 p. 100 for both WB and control diets). Ca adsorption was the same for all diets, but Ca was better retained in rye bran-fed than in corresponding controls. Pigs fed both, rye or wheat, bran diets showed a higher bone bending moment (BM) and density than controls, the greatest effect occurring with rye bran (tibial BM

increased by 60 p. 100 compared to the control value). The noticeable differences between the effects of WB and RB diets on Ca-P metabolism might be attributed to the 16-times higher dietary phytase activity of RB. However, other variables such as trial length or percentage of bran incorporation might explain these differences.

Our results clearly demonstrate that high dietary phytase levels or rich phytase by-products lead to a better P utilization. A reduction of requirements for inorganic P might save money since this P is still one of the most expensive feed ingredient in pig feeding.

## **Comparative efficiency of four iron dextran injectable solutions**

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A trial was made to compare four iron dextran solutions in 209 piglets belonging to 23 litters of 9 and 10 piglets and randomly allotted to one of the five treatments : A : 10 p. 100 iron dextran (2 ml) ; B : 20 p. 100 gleptoferron (1 ml), C : 20 p. 100 iron dextran (1 ml), D : another 20 p. 100 iron dextran preparation (1 ml), E : control (no iron). Injections were made via the intramuscular route on the first day of life. At the end of the third week blood parameters were measured. Growth and feed conversion ratio were studied up to 10th week.

At three weeks of age, results of blood analyses were as follows : red blood cell count (RBC) = 6.23 - 5.87 - 6.09 - 6.03 and 5.06 millions/ $\mu$ l ; hemoglobin = 11.75 - 11.19 - 11.64 - 11.56 and 6.52 g/100 ml ; hematocrit = 40.49 - 38.0 - 39.80 - 39.52 and 25.84 p. 100. Live weights were 6.59 - 6.76 - 6.64 - 6.67 and 4.96 kg. After weaning, growth rate and daily mean gain remained higher in treated animals.

No difference was noted in the efficiency of the four treatments. Iron concentration (10 or 20 p. 100) had no effect on measured parameters. In contrast, blood parameters and performance were higher in treated animals than in controls.

## **Influence of gestation and lactation food supply on the performance of sows fed a maize-based diet**

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Three gestation and lactation diets based on maize were studied. In treatments I and II the diets consisted of maize, barley, bran and soybean meal. In treatment III they only included maize supplemented with soybean meal. During gestation, treatment I supplied 280 g protein and treatments II and III, 330 g in early gestation and 400 g in late gestation (the last month). Digestible energy supply was respectively 7,700 kcal or 7,700 kcal and 9,300 in late gestation. The dietary supply remained constant whatever the parity or the condition of the sow. During lactation, treatment I supplied 150 g protein/kg of diet, treatments II and III, 180 g.

The experimental herd of 168 Large-White sows was kept in batches with weaning of piglets at 28 days of age and a weaning-mating interval shorter than 6 days, i.e. 2.48 littering/sow/year. Results concerned 350 litters per treatment. Gilts were mated at 220 days of age with a mean live weight of 136 kg.