

## THE USE OF FULL-FAT SOYBEAN AS PROTEIN SOURCE IN SWINE

## LACTATION AND STARTER DIETS

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New alternatives for feeding swine are constantly being studied. Recently, there has been an interest for the use of full-fat soybean in swine diets. Several studies have shown that heat-processed soybeans can completely substitute soybean meal in growing finishing diets, frequently with beneficial effects on performance (Jimenez *et al* 1964; Villegas *et al* 1973; Carlisle *et al* 1975). However the results with young pigs and lactation sows have been variables (Buitrago, Portela y Jimenez, 1975; Faber y Zimmerman, 1970; Noland *et al* 1970). The objective of this study was to evaluate the use of full-fat soybean as a protein source in lactation and starter diets in an early weaning system.

Two experiments were conducted, one for the lactation period and the other for the starter period. In experiment one, seventy two crossbred (Yorkshire Landrace) sows were divided in 3 groups of 24 animals according to number of litters and allotted in individual farrowing crates. Three dietary treatments were evaluated: A) full-fat soybean; B) 50% full-fat soybean + 50% soybean meal and C) soybean meal. The experimental period was 28 days. Litters were equalled to nine pigs of similar weight. Feed was offered in amounts of 500 gr/pig. The diets contained 15% protein and 0.60% lysine. Corn was used as an energy source. Vitamins and minerals were supplemented to meet NRC requirements.

Performance data from sows and their litters were subjected to analysis of variance using a 3 x 2 factorial experiment design.

In the second experiment, 480 crossbred baby pigs with an initial weight of 6.7 Kg. were divided in 3 treatment group and allotted to 24 pens of 20 pigs each. The experimental treatments were: A) full-fat soybean. B) 50% full-fat soybean + 50% soybean meal and C) soybean meal. The experimental period was 28 days. Feed and water were supplied *ad-libitum*. The diets contained 20% protein and 1.15% lysine. Corn was used as an energy source. Vitamins and minerals were supplemented to meet NRC requirements. Performance data were subjected to analysis of variance, using a complete randomized design.

In the first experiment, there were no significant differences in lactation weight changes, days to return on estrus and % fertility at first service between dietary treatments. Sows lost 15, 15 and 14 kgs. in A, B and C treatments, respectively. Sows receiving the full-fat soybean as 50 or as 100% of their protein source required the same number of days (9) to return of estrus after weaning, while the 100% soybean meal sows needed 10 days. Percentage fertility at first service were 88.20, 87.10 and 86.45% for A, B and C treatment, respectively.

No significant effect on weaning weight, number of pigs weaned and % mortality were observed between treatments. The values for these parameters were 5.23, 5.02 and 5.05 kgs for weaning weight, 8.54, 8.67 and 8.75 for number of pigs weaned and 5.10, 3.70 and 2.80 percent mortality for A, B and C treatments, respectively. No significant differences were observed between litters and treatment litter interaction.

Total weight gains of pigs fed 50 or 100% of their protein source as soybean meal gained ( $P < 0.05$ ) faster than pigs fed 100% full-fat soybean. Total weight gains were 3.66, 4.38 and 4.36 for A, B and C treatments, respectively. There were significant ( $P < 0.05$ ) differences in feed intake between treatments. Pigs fed the 100% full-fat soybean diet consumed significantly less feed (7.50 Kg) in the total experimental period than pigs fed 50% full-fat soybean + 50% soybean meal and soybean meal diets. Feed intake was 8.14 and 8.07 Kg respectively. The amount of feed required per Kg of gain was approximately the same for all treatments, except for the 100% full-fat soybean group which presented the poorest feed efficiency. However there were no significant differences between treatments for this parameter. Feed conversion was 2.05, 1.86 and 1.85 for A, B and C treatments, respectively.

## Conclusions:

Based on the results we can conclude that full-fat soybean can be used as the only source of protein for lactation diet, but for starter diets a combination of 50% full-fat soybean + 50% soybean meal gave the best performance. When 100% full-fat soybean is used as a protein source is necessary to increase the nutrient concentration of the diets, due to the high density of the diet that affect feed intake.

Selected references: Buitrago, J., R. Portela and I. Jimenez. 1975. ICA, Serie ES-24, Colombia; Carlisle, G.R., D.H. Baker, B.G. Harmon and A.H. Jenseny. 1975. Illinois Pork Industry Day Re. AS:6656; Faber, J.L. and D. R. Zimmerman, 1973. J. Ani Sci 36:902; Jimenez, A., T. Perry, R. Pickett and W. Beeson, 1964. J. Ani Sci 22:471; Noland P., C. Baugus R. Sharp and Z. Johnson 1970. Ark Farm Research 29 (6): 8; Nutrient requirement of swine. National Academy of Science. 1979. Washington, D.C. Villegas, F.H. Kedrooj. T. Veum, and K. McFate, 1973. J. Ani Sci 36:663