

## USE OF FULL-FAT SOYBEAN IN GESTATION AND LACTATION DIETS FOR SOWS.

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There is increasing interest to use full-fat soybean as an ingredient for swine diets. The most frequent reason for this situation is that full-fat soybean is an excellent dietary protein and energy source. The product contains approximately 3840 K cal of metabolizable energy per Kg, 38% crude protein, 2.39% lysine, 1.11% methionine plus cysteine and 2.89 arginine (Mc Naughton and Reece, 1981). This nutrient composition makes this product an adequate source of nutrients, specially for reproduction wherethere is a high demand for energy and protein quality. For that reason, the present study was conducted to compare full-fat soybean and soybean meal as a protein source during gestation and lactation for sows maintained in semiconfinement system.

Ninety crossed sows (Yorkshire-Hampshire) with an average weight of 150 Kg were mated and allotted according to litter number to three experimental diets using full-fat soybean and soybean meal as protein sources. The dietary treatments were: A) full-fat soybean; B) 50% full-fat soybean + 50% soybean meal and C) soybean meal.

The bred sows were confined to concrete pens in groups of 15 sows during the first 25 days of gestation and then when pregnancy was confirmed they were moved to pasture lots of 30 sows each. In each different dietary treatment, sows received 2 kg per day of 14% crude protein and 0.50% lysine diets during gestation. Sorghum grain was used as an energy source and vitamins and minerals were added to meet NRC requirements for the gestation period. Fifteen percent wheat bran and 15% sugar cane molasses were added to all dietary treatments.

The sows were moved to farrowing crates on the 108th day of gestation. At 14 days postpartum sows and litters were moved to individual pens.

Lactation was extended to 6 weeks. The baby pigs were offered the same creep feed for all dietary treatments at 14 days postpartum. Sows were fed *ad-libitum* during the lactation period and diets contained 15% protein and 0.60% lysine. Similar to the gestation diets, sorghum was used as an energy source, and 10% wheat bran and 5% sugar cane molasses were added to all dietary treatments. Vitamins and minerals were supplemented to meet NRC requirements for lactation.

Weight of the sows were taken at breeding, 113 day farrowing and weaning (42) days. Performance data of the litters were taken at farrowing and weaning. Performance data from sows and their litters were subjected to analysis of variance, using a 3 x 3 factorial experiment design. Full-fat soybean was processed by extrusion cooking method.

Differences between dietary treatments in sow body weights from breeding to 113 day of gestation and at farrowing were significant. Sow weights for the full-fat soybean diet; 50% full-fat soybean + 50% soybean meal and soybean meal diet were 190, 186 and 182 Kg at 113th day of gestation and 167, 164 and 159 Kg at farrowing, respectively, being the full-fat soybean sow weights higher ( $P < 0.05$ ) than the soybean meal sow weights. There were significant differences ( $P < 0.05$ ) for sow weight at weaning. Sows that received treatment A and B, obtained higher ( $P < 0.05$ ) weight at weaning. The weaning weights were 147, 143, and 134 Kg for groups A, B and C, respectively. Lactation weight changes were also significantly affected by dietary treatment. Sows that received diets containing the full-fat soybean as an only source of protein, or as 50% of the protein, lost less weight ( $P < 0.05$ ) than sows fed the soybean meal diet. These results suggested

that the energy present in the full-fat soybean maintained the sows in better body weight conditions during gestation and lactation.

No significant effects for litter data were observed between dietary treatments. However, there was a slight trend toward a lower number of the pigs total born, live born and weaned when soybean meal made 50 or 100% of the protein source. The full-fat soybean fed sows obtained the highest values of both parameters. The values obtained for these variables in the A, B and C treatments were 10.35, 10.30 and 10.05 for total born; 9.30, 9.10 and 9.18 for live born and 8.27, 8.20 and 8.12 for number of pigs weaned at 42 day, respectively.

Pig birth weights and weaning weights did not differ ( $P > 0.05$ ) among dietary treatments, although pigs from the full-fat soybean diet obtained the highest values for both parameters. Pig birth weights were 1.45, 1.43 and 1.44 Kgs weaning weight were 9.30, 9.10 and 9.08 Kgs for the A, B and C treatments, respectively.

Total feed consumed daily for the lactation period was nearly the same for all treatments. However, sows receiving the soybean meal diet consumed the highest amount of feed per day, followed by the sows fed the 50% full-fat soybean + 50% soybean meal diet. Daily feed intake was 4.8, 5.1 and 5.21 Kgs for the A, B and C treatments, respectively. Protein sources did not affect ( $P < 0.05$ ) percentage mortality among treatments. The values for the full-fat soybean; 50% full-fat soybean + 50% soybean meal and soybean meal diets were 11.07, 10.00 and 11.55% respectively.

The results of this experiment also revealed no significant differences for litter number and diet litter interaction. However, sows of 4 litter obtained the highest average performance data for all parameters, followed by sows for third and second litter, respectively.

#### Conclusion:

Based on the results we can conclude that full-fat soybean is an excellent source of protein and energy for gestation and lactation sow diets.

Selected references: Mc Naughton, J. and Reece, F.N. 1981. U.S. Department of Agriculture, ARS, South Central Poultry Research Laboratory. Mississippi State University; Nutrient Requirement of Swine. National Academy of Science 1979. Washington, D.C.