Impact of complete replacement of soybean meal with further processed sunflower meal in nursery pig feeding program

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Soybean meal (SBM) is the primary protein source in swine diets globally, but is facing supply chain vulnerability, global price volatility, and sustainability pressures. Sunflower meal (SFM), a byproduct of sunflower oil extraction, offers an alternative protein source due to its lower price in regions with local availability. The high fiber limitation of SFM could be addressed through further processing.

This study aimed to evaluate the impact of a fully dehulled cold-pressed SFM (FPSFM) as a complete replacement for SBM in nursery pig diets. The contents of crude protein (CP) and fat in the FPSFM were 43.8 and 11.6% DM, respectively and the contents of CP and fat in the SBM were 45.30 and 2.02% DM, respectively. Two diets were formulated with either SBM or FPSFM as the sole plant protein and were adjusted to be isonitrogenous and isoenergetic. Diets were provided *ad libitum* between days 0-14 (phase 1) and days 15-40 (phase 2) after weaning. A total of 96, 21 d old, newly weaned piglets were placed in 16 pens (6 pigs/pen) balanced for body weight (BW) and sex. The diets were allocated in a completely randomized design (n=8). BW and feed intake were recorded weekly. Fecal consistency was monitored in week 1 on a scale of 0-5 with 0 indicating normal firm-solid feces and 5 indicating aberrant bloody liquid feces. At the end of phase 1, one pig/pen was randomly selected, bled for plasma biochemistry, euthanized and necropsied for organ weights. Data were analyzed using a mixed model with diet as a fixed effect and pen as the experimental unit.

Piglets fed FPSFM were lighter than SBM on days 7 ($p=0.017$) and 21 ($p=0.005$), however, there were no differences on BW by nursery exit (day 40). There were no diet effects on average daily gain and average daily feed intake throughout the trial, but the overall (d0-40) gain-to-feed ratio was less for FPSFM group ($p=0.006$). There was no ($P>0.05$) dietary effect on fecal consistency scores. Organ weight and blood plasma biochemical analyses were not influenced by dietary protein source on day 14.

Therefore, replacing SBM with FPSFM in nursery diets reduced early body weight and overall feed efficiency indicating that further optimization of the diet formulation (e.g., enzyme or amino acid supplementation) may be needed to match SBM-based performance. Further research will focus on growth performance of pigs during the grower and finisher phases, nutrient digestibility, carcass traits at market weight, and economic feasibility.