

Extruded Soybean Meal Shows Promise as Chicken Feed

LSU AgCenter research has shown soybean meal made by extrusion could be as good as conventional soybean meal for use in chicken feed.

Dr. Lee Southern in the School of Animal Sciences performed a laboratory analysis on extruded soybean meal and then conducted two feeding studies with chickens. He used corn/soybean meal diets with conventional soybean meal and with extruded soybean meal to determine growth performance and carcass traits.

“There wasn’t a lot of difference,” Southern said.

The extrusion process extracts soybean oil by pressing the beans rather than by using a solvent, which is what processors conventionally use.

The extrusion process, Southern said, leaves more oil in the meal – 7 percent versus virtually none from solvent extraction. In addition, the heat from pressing destroys the anti-nutritional factors that cause soybeans to be indigestible for nonruminants, including chickens and pigs, as well as people, dogs and cats.

Because most diets for pigs and chickens have oil or fat added to increase the energy level, soybean meal with higher oil content could be cost-effective for chicken producers.

Southern conducted a series of two experiments to evaluate extruded meal as chicken feed. First, he analyzed the meal for amino acid concentration. Then he used the resulting data to develop a variety of feeds using corn with conventional solvent-extracted soybean meal and with extruded soybean meal. The diets were based on chemical evaluations of both types of soybean meal, which were then blended with corn and other components to arrive at the diets used in the feeding trials.

The initial 18-day feeding study used six diets that were fed to small groups of broilers to determine average daily gain, average daily feed intake and feed efficiency. The diets – using corn with both types of soybean meal – were designed to measure the results with a protein-deficient diet, an energy-deficient diet and a diet with adequate protein and energy components.

Once Southern determined the adequate diets in the first experiment were indeed adequate, he used the results to test larger groups of birds.

From the study, Southern concluded the amino acid digestibility in the extruded meal was slightly less than for the conventional meal, but when the variation among samples was considered, there was no difference.

“When diets were formulated that take into consideration the higher energy value of the extruded soybean meal and the actual amino acid values of both meals, broiler growth was the same for both,” Southern said. “Broilers fed the extruded meal tended to eat less feed, which suggests that the energy value of this soybean meal is slightly higher than predicted.

“Carcass evaluation showed broilers fed both soybean meal types had similar carcass weights, but breast yield was lower for broilers fed extruded meal,” he added. “This indicated a redistribution of the meat or excess fat deposition.”

Southern said the extruded meal “results in similar growth performance of broilers as those fed conventional soybean meal when the different nutrient content of the meals is used in diet formulation.”

He also said the nutritional value of extruded soybean meal is good – with a little less protein but more oil than conventional soybean meal. “It’s very nutritious,” he said. “We need to know as much about it as we can.”

Southern said the research suggests the diet they developed had a slight amino acid deficiency that led to the reduced breast meat.

“It could be overcome with more research to evaluate the diets,” Southern said. A more extensive and careful biological and chemical evaluation of extruded soybean meal could answer the question of the differences in production.

“The soybean meals are very similar,” he said. Rick Bogren