## Nutritive value of soybean meals from different origins differ

**S**OYBEAN meal is the most widely used protein supplement in poultry feeds on the planet. Without overlooking the fact that the grain source in poultry feeds — usually corn, wheat or sorghum — accounts for a major portion of the protein — as much as 50% — soybean meal is the go-to source for supplemental protein in poultry feeds.

Soybeans are adapted to be able to grow in many countries. Still, major areas of commercial poultry production do not produce enough soybean meal to meet their own needs. The U.S., Brazil and Argentina are the primary sources of exported soybean meal.

It is certainly important, if not critical, that nutritionists in importing countries and companies have reliable information about the nutritive value of soybean meal sources so they can make informed decisions about the purchase of soybean meal.

Guzman et al. presented a paper at the 2016 annual meeting of the Poultry Science Assn. on the chemical characteristics of soybean meals available in the European Union market based on a 2015 survey (abstract 83). For this survey, a total of 40 soybean meal samples were collected at random from five key feed manufacturers. Of the 40 samples, 14 had been imported from the U.S., 15 imported from Brazil and 11 imported from Argentina.

All of the samples were analyzed for proximal components (crude protein, crude fat, crude fiber, ash, nitrogen-free extract and dry matter), sugars, amino acids and indices of protein quality.

The results from analyzing the samples showed that soybean meal from Brazil contained significantly higher percentages of crude protein, crude fiber and neutral detergent fiber than soybean meals from the U.S. or Argentina. Soybean meal from Brazil also contained significantly less sucrose compared with soybean meals from the U.S. or Argentina. Soybean meals imported from the U.S. had significantly lower raffinose (an indigestible short-chain carbohydrate) content compared with soybean meals imported from either Brazil or Argentina.

The analyzed calcium content was significantly higher for the soybean meal imported from the U.S. compared with

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the samples from Argentina or Brazil. The analyzed total phosphorus level was significantly higher for soybean meal from Argentina than in soybean meals from the U.S. or Brazil.

In general, the indispensable amino acid profile was better for the meals imported from the U.S. than for the meals from Brazil. The amino acid profile results for the meals from Argentina were intermediate. The analysis for lysine, methionine, cysteine and tryptophan as a percent of crude protein was significantly higher in U.S. and Argentine soybean meals compared with the results for Brazilian soybean meal.

In addition, the values for the protein dispersibility index and potassium hydroxide solubility were significantly higher (better) for the soybean meals imported from the U.S. compared with soybean meals imported from Argentina or Brazil. Also, values for heat damage index and urease activity were significantly lower in the U.S. meals compared with the meals from Argentina and Brazil. However, no significant differences in trypsin inhibitor activity were detected among the three soybean meal sources.

The researchers noted that, in general, the data from the 2015 survey were in agreement with data previously reported based on surveys conducted in Europe for 2008-14 involving a total of 515 soybean meal samples.

The researchers concluded that, when compared on a isoproteic basis, the protein quality indicators, levels of fiber and sucrose and amino acid profile favored the use of soybean meal from the U.S. in poultry feeds. The researchers further suggested that the origin of soybean meals should be specified in feed ingredient tables to allow for more accurate and precise formulation of poultry feeds.

## Apparent digestibility

Camara et al. presented a somewhat related paper on how soybean meals of different origins affected the apparent ileal digestibility of amino acids in 22-day-old broilers (abstract 388P).

A total of nine soybean meal samples — three each originating from the U.S., Brazil and Argentina — were collected by trained personnel at the discharge of cargoes in the EU. Each sample was evaluated for the apparent ileal digestibility of amino acids using 10 replicate cages of five broilers per cage.

All birds were fed a commercial corn/ soybean meal diet in pellet form from one to 18 days of age. The corresponding experimental diets were in mash form. The experimental diets were fed from 18 to 22 days of age and consisted of 42.6% of the experimental soybean meal sample and 57.4% of a nitrogen-free mix of corn starch, dextrose, soybean oil, minerals and solka-floc.



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In general, the apparent ileal digestibility of the dry matter, crude protein and most of the amino acids (lysine, methionine and threonine) was higher for the soybean meal samples of U.S. origin than for the South American meals, although the differences were not significant.

These papers originated from research conducted in the laboratory of Dr. Gonzalo G. Mateos in the Departamento de Produccion Agraria at the Universidad Politecnica de Madrid in Madrid, Spain. For more detailed information, contact Mateos at gonzalo. gmateos@upm.es.

The abstracts from the 2016 annual meeting may be found at www.poultry science.org/abstracts.asp.

## The Bottom Line

Mateos' laboratory in Madrid has col-

lected samples, analyzed the nutrient content and published the results of a survey of soybean meals imported into the EU every year since 2008. The results have consistently shown significant differences in the nutrient content of the soybean meals that are related to the country of origin. It is important to take these differences into account in the formulation of poultry feeds.