everyone in the broiler industry knows and accepts that breeder feeds are consistently over-formulated. Why? Because the loss of even one hatchability per breeder or a reduction in hatchability of 0.1% represents a major economic loss in the form of dead eggs. The pain associated with this economic loss is more than most nutritionists want to contemplate. Having said that, it is still important to review research on the requirements of the breeder hen from time to time.

At the International Poultry Scientific Forum held in Atlanta, Ga., L. Mejia and A. Corzo of Mississippi State University reported on the effect of reduced lysine intake on the reproductive performance of Cobb 500 breeder hens (abstract P17).

The objective of the research was to examine the reproduction and performance of broiler breeder hens fed different amounts of digestible lysine. In the study, 240 Cobb 500 broiler breeder pens of 400 birds that were 20 weeks of age were obtained from a commercial blackrock rearing house and placed in individual cages. A common breeder diet containing 16.1% crude protein, 3.5% calcium and 0.65% digestible lysine was fed from 24 weeks to 42 weeks of age.

There were four experimental treatments. Treatment 1 was a typical corn/soybean meal diet formulated to provide a digestible lysine intake of 1,000 mg per hen per day. The diets for treatments 2, 3 and 4 were formulated with the inclusion of drier distillers grains with solubles and provided digestible lysine intake levels of 1,000 mg, 800 mg and 600 mg per hen per day, respectively. The study was a completely randomized design, and each treatment was replicated six times with 10 hens per replicate. All hens were artificially inseminated at weeks 25, 30, 35 and 41 with 50 microliters of undiluted semen obtained from the Cobb 500 breeders.

Hen-day egg production and egg weight were observed to be similar among all of the treatments. Fertility parameters were unaffected by the reduced lysine intake levels fed. Early dead, middle dead, late dead, contaminated or pipped eggs were similar for all treatments, and hatchability was not altered by lysine intake levels.

The researchers noted that feeding digestible lysine levels of less than 1,000 mg per hen per day did not affect broiler breeder reproductive performance, suggesting that lysine may be in surplus under current practical conditions.

**Comments**

Broiler breeder feeds are seriously over-formulated in vitamins, trace minerals and, especially protein. The costs, both economic and environmental, associated with excess vitamins and trace minerals are probably not significant enough to spend very much time thinking about them. Protein, on the other hand, is quite another issue. The economic cost of excess protein is significant, and the environmental impact is important. In addition, an excess protein restriction will have an effect on ingredient cost. If individual amino acid values are adequate, then theoretically, a protein restriction shouldn’t be needed at all. If you don’t feel comfortable suggesting that the broiler breeder might be running a cage (without a protein restriction), try nibbling around the edges by formulating to meet digestible amino acid requirements while reducing the total protein intake to observe how it affects the formulation.

This research suggests that the current digestible lysine intake level may be in surplus by as much as 20% to 25% under practical conditions. This issue is so important that it deserves a major research effort to attempt to define the digestible amino acid requirements and protein restriction for broiler breeder hens.

**The Bottom Line**

Broiler breeder hens are over-formulated just to be on the safe side, but the feeling of safety is not trivial. The Mejia et al. research suggests that the commercial levels of digestible lysine (and, perhaps, other amino acids) are much higher than necessary to support optimum performance. Some thought and attention should be given to approaches to reduce some of these safety levels while maintaining optimum broiler breeder performance.

**Canola meal**

The use of canola oil in broiler production has been stimulated in the production of canola as a winter crop in the southern U.S. As a result, more canola meal may be available for use in poultry feeds.

Due to the high fiber content of canola meal, diets containing canola meal are typically lower in energy unless supplemented with added fat. C. Bradley, S.D. Goodgame, F.J. Mousumi, N. Comert, C. Lu and P.W. Waldroup from the University of Arkansas presented a paper on the use of canola meal in high-energy broiler diets (abstract P152). In this research, diets were formulated to meet digestible amino acid requirements suggested by Banjerdruk (1995), with no protein minimum. Also, all diets were formulated to be isonitrogenous with an adjustment of the poultry oil content. The experiment was conducted for the growth of age-utilizing appropriate starter, grower and finisher diets. Within each growing period, diets were produced by blending one diet containing soybean meal and a second diet in which the soybean meal was completely replaced with canola meal.

Six experimental diets in each growing period contained 6%, 10%, 20%, 30% and 40% canola meal and diets with 50% canola meal. The soybean meal diet contained 1% poultry oil. The diet containing canola meal completely replacing soybean meal contained 7.0%, 6.6% and 6.2% poultry oil in the starter, grower and finisher diets, respectively.

Birds fed diets containing up to 40% canola meal did not differ significantly in body weight than those fed 0% canola meal diets at both 35 and 42 days of age. However, birds fed diets with the lowest level of canola meal had significantly lower bodyweight compared with the 0% canola meal diet. Feed conversion became poorer with each incremental increase in canola meal.

The researchers suggested that the higher levels of poultry oil associated with the canola meal diets resulted in reduced pellet quality, which might be partly responsible for the poorer feed conversion. There tended to be a linear decrease in breast meat yield as the canola meal level increased. In experimental design, the standard approach is to control for as many factors as possible, i.e., iso-digestible amino acids and iso-caloric diets in this experiment. The researchers suggested that more research should be conducted with lower levels of added oil in the canola meal diets.

**The Bottom Line**

The Bradley et al. research suggests that canola meal may be used as a partial replacement for soybean meal in some broiler diets when the diets are formulated on a digestible amino acid basis.

**Phytase, protease**

S. Vierra, A. Favero and H. Cenin of the Universidade Federal de Pernambuco, Recife, Grande do Sul in Brazil and R. Angel of the University of Maryland reported on a study conducted to evaluate the effect of phytase and protease supplementation in corn/soybean meal breeder diet smartphone (abstract P138).

The experiment used 270 Cobb 500 male broilers. There were six treatments, with eight replicates of five birds per replicate fed in battery cages from one to 21 days of age. The diets included a positive control (PC) diet that contained 0.37% non-phosphate phosphorus and a negative control (NC) diet containing 0.23% non-phosphate phosphorus. Levels of phytase from Penicillium ficaceum were added to the NC diet to provide 500, 1,000 or 1,500 units of phosphate activity (FYT).

One additional treatment consisted of the NC diet with the addition of 600 FYT plus 200 ppm of phytase from Nocardiopsis promiscua (75,000 PROT units per gram of enzyme). All of the experimental diets contained 22.0% crude protein (1.15 digestible lysine), 0.86% digestible total sulfur amino acids and 0.75% digestible threonine, 0.80% calcium and 2.9% replacement. The metabolic energy value per kilogram.

The results of the experiment are shown in the Table. The bodyweight gain observed for chicks fed the NC diet was significantly less than the gain observed for the PC diet. There was a significant bodyweight gain with the first addition of the phytase (500 FYT), with no further gains with the additional additions of phytase. The addition of the protease did not improve the bodyweight gain.

The responses observed for feed conversion were not much like the responses obtained for bodyweight gain. There appeared to be a numerical response in feed conversion to the addition of the protease enzymes in the 1,500 FYT phytase treatment.

**The Bottom Line**

The Vierra et al. research shows that adding phytase to a diet demonstrated to be deficient in available phosphorus resulted in only improved growth performance and achieved that performance at a level similar to that observed on the performance of the PC diet.

The addition of protease with the phytase did not improve bodyweight gain but did numerically improve feed conversion. Of course, the NC diet was not designed to be deficient in essential amino acids, and a response to protease probably should not be expected.

There was no indication that the protease had any adverse effect on the phytase enzyme.


In 60 seconds

**Oral solution**: Teva Animal Health has introduced Amprolium-P (amproli- um) 9.6% Oral Solution to treat coccidiosis in growing chickens, turkeys and laying hens. This follows the reintroduction of Teva’s Amprolium 9.6% Oral Solution for cattle in February. Teva said the product, available in quart and gallon sizes, is designed to control a diversity of coccidiosis in a ready-to-use, 9.6% concentrated solution that can be easily diluted with water for a liquid stock solution or to medicate the water directly.

Liquid concentrate: Aurora Pharmaceuticals has introduced ORAL-PRO Vitamin D3 plus E Dispersible Liquid Concentrate, which is labeled for oral use in young swine and in the drinking water of poultry and swine. The product is available in pints and gallons. The company noted that recent University of Wisconsin research confirmed the importance of supplementing both vitamin D3 and vitamin E for enhancing bone development in pigs. Aurora noted that the new product is used as a feeding solution in a 1 mL oral product for baby pigs or diluted in a stock solution at 0.5 oz./gal. for administration to nursery pigs and poultry.