

### 372P Withdrawn.

**373P Japanese quails responses to lysine intake.** Miryelle F. Sarcinelli, Nilva K. Sakomura\*, Edney P. Silva, Juliano C. P. Dorigam, Daniela C. Z. Donato, Katiani S. Venturini, Camila A. Gonçalves, and Paulo Matsumura Júnior, *Universidade Estadual Paulista, Jaboticabal, São Paulo, Brasil.*

The objective of this study was determine the optimal intake of lysine for Japanese quails, through of the polynomial quadratic with broken-line plateau model. 392 Japanese quails with 14 weeks of age, were distributed in a completely randomized design, with 8 treatments (lysine levels), 7 replicates and 7 birds per experimental plot. A diet with high protein level (summit) and a nitrogen-free diet were formulated. Both diets had the same level of minerals, vitamins, and energy. The lysine content of the summit diet was 13 g/kg, considering 120% of the lysine requirement recommended by the Brazilian Tables and 140% for the remaining amino acids, to create a relative deficiency of 20% of lysine. The intermediary lysine levels (0.260; 0.520; 0.650; 0.780; 1.040; 1.117 and 1.300%) were obtained by successive dilutions of the summit diet with the nitrogen-free diet. A eighth treatment was added (1.61g of Lysine HCl, in 0.260 diet) to confirm if lysine was the first limiting amino acid. The trial lasted 10 weeks (6 weeks of adaptation and 4 weeks of data collection). The additional response observed in the 8 treatment confirmed that lysine was the first limiting amino acid in the diet. The studied variables to estimate the polynomial quadratic with broken-line plateau model for lysine answers were: feed conversion (g/g), egg production (%) and egg mass (g). The polynomial quadratic with broken-line plateau models were adjusted taking into account the lysine consumption as a function of feed conversion, egg production and egg mass. We estimated the intake of 220; 218; 254 mg/bird/day feed conversion, egg production, and egg mass, respectively. The ideal intake of lysine for Japanese quails, considering the egg mass was 254 mg /bird / day, corresponding to the level of 0.990% of digestible lysine.

**Key Words:** amino acid, dilution technique, egg mass, polynomial quadratic with broken-line plateau model

**374P Protein levels and amino acid supplementation to broilers from 22 at 42 days old.** L. C. L. Camelo<sup>1</sup>, C. B. V. Rabello<sup>1</sup>, C. J. P. Oliveira<sup>2</sup>, D. P. Oliveira<sup>1</sup>, C. C. Lopes<sup>2</sup>, F. G. P. Costa\*<sup>3</sup>, and I. M. B. Lorena-Rezende<sup>1</sup>, <sup>1</sup>*Universidade Federal Rural de Pernambuco, Recife, Pernambuco, Brasil,* <sup>2</sup>*Universidade Federal de Sergipe, Aracaju, Sergipe, Brasil,* <sup>3</sup>*Universidade Federal da Paraíba, Areia, Paraíba, Brasil.*

The purpose of this study was to evaluate the effect of different levels of crude protein (CP) and amino acid supplementation on performance, carcass yield and nitrogen excretion for male broilers, from 22 to 42 d old. 612 broilers, Cobb 500, were distributed in a completely randomized design consisting of 6 treatments and 6 replicates of 17 birds each. The experimental diets were formulated to contain 6 crude protein levels (16.1; 17.1; 18.1; 19.1; 20.1 and 21.1%) based on corn, soybean meal and supplemented amino acids (lysine, methionine, threonine, tryptophan, arginine and valine) to maintain levels and relations of amino acids equal between the treatments. Feed intake, weight gain, feed conversion, carcass yield, nitrogen excreted were evaluated. Data were analyzed using procedure PROCREG in the SAS Program ( $P < 0.05$ ). No significant differences were found for feed intake, weight gain, feed conversion and carcass yield, however the nitrogen excretion increased significantly (1.36 g/d vs 1.69 g/d;  $P = 0.0072$ ;  $Y = 0.0689x + 0.2609$ ;  $R^2 = 0.94$ ) when CP was increased of 16.1 to 21.1%. In conclusion, the dietary with crude protein levels of 16.1% and amino acids supplementation

can reduce the amount of nitrogen excreted by broilers from 22 to 42 d old, without effect on performance and carcass yield.

**Key Words:** amino acid, carcass yield, performance, nitrogen excretion

**375P Comparison of standardized ileal amino acid digestibility of three different pea products in growing turkeys.** Krzysztof Kozłowski\*<sup>1</sup>, Jan Jankowski<sup>1</sup>, Farshad Goodarzi Boroojeni<sup>2</sup>, Jürgen Zentek<sup>2</sup>, and Martin Senz<sup>3</sup>, <sup>1</sup>*Department of Poultry Science, University of Warmia and Mazury, Olsztyn, Poland,* <sup>2</sup>*Department of Veterinary Medicine, Free University, Berlin, Germany,* <sup>3</sup>*Department Applied and Molecular Microbiology, Berlin University of Technology, Berlin, Germany.*

The experiment was performed with 288 10-week-old Hybrid Converter male turkeys (4 treatments, 6 pens and 12 birds per pen). The experimental diets were including pea (P), fermented pea with probiotic (PP), pre-digested pea with enzymes mixture (PE) and a N-free diet (all supplemented with vitamins and minerals). P contained 20.8, 0.9, 1.7, 0.5, 2.2, 0.9, 0.7, 0.8, 1.4, 1.5, 0.2, 1.0, 0.9, 1.1, 0.8 and 0.9%, PP contained 21.6, 0.9, 1.5, 0.5, 2.1, 0.9, 0.7, 0.8, 1.4, 1.5, 0.3, 1.0, 1.0, 1.0, 0.8 and 0.9% and PE contained 21.1, 0.9, 1.7, 0.5, 2.1, 0.9, 0.7, 0.8, 1.4, 1.5, 0.2, 1.0, 0.8, 1.1, 0.8 and 0.9% of CP, Ala, Arg, Cys, Glu, Gly, His, Ile, Leu, Lys, Met, Phe, Pro, Ser, Thr, Val, respectively. After 7 d experimental feeding, all birds were killed, their ileal content were collected, pooled and analyzed for their amino acids (AA) content. The standardized ileal digestibility (SID) of CP, Ala, Arg, Cys, Glu, Gly, His, Ile, Leu, Lys, Met, Phe, Pro, Ser, Thr and Val for P were 91.1, 89.9, 96.3, 87.8, 92.9, 91.5, 92.0, 89.5, 91.0, 92.3, 89.7, 92.0, 95.1, 93.2, 90.7 and 88.6%, for PP were 91.6, 92.1, 96.8, 82.9, 94.4, 92.4, 94.6, 92.7, 93.5, 93.8, 91.7, 93.3, 96.5, 93.3, 89.7 and 91.2%, and for PE were 96.7, 96.7, 99.5, 88.5, 97.6, 96.3, 98.1, 97.3, 97.6, 97.5, 101.9, 98.3, 97.0, 96.7, 93.9 and 95.8% respectively. In general, the enzymatic pre-digestion of pea improved the SID of CP and most of AAs. The standardized ileal digestibility of CP, Ala, Glu, Gly, His, Ile, Leu, Lys, Met, Phe and Val for PE were significantly higher than those obtained for P. Only SID value for Cys in P group was significantly higher than in PP group. The results of this study showed that enzymatic pre-digestion can improve the nutritional quality of pea for turkey nutrition.

**Key Words:** pea, fermentation, enzymatic pre-digestion, SID, turkey

**376P Adsorption isotherms of amino acids used in feed.** Carina Sordi<sup>1</sup>, Diego Surek<sup>2</sup>, and Fernando de Castro Tavernari\*<sup>2</sup>, <sup>1</sup>*FACC, Concórdia, Santa Catarina, Brazil,* <sup>2</sup>*Embrapa Suínos e Aves, Concórdia, Santa Catarina, Brazil.*

An experimental trial was carried out to determine adsorption isotherm of amino acids (L-lysine HCl, DL-methionine, L-threonine, L-valine and L-tryptophan) to predict water adsorption under different air relative humidities (RH%). Amino acids samples were collected in unopened bags and analyzed for water activity (Aw) and moisture (M%). Samples ( $\pm 3$ g) were stored in open plastic container and dried in a silica gel desiccator under vacuum and at temperature of 30°C for over 24 h. Later, samples were transferred to a desiccator containing water and under controlled conditions for monitoring changes in RH% and temperature every 10 min. Aw and M% (natural basis) from each sample was assessed at time 0; 1; 3; 5; 7; 8:30; 24 and 26 h after the beginning of humidification. Experiments were performed in triplicate. Aw and M% were estimated according to GAB's mathematical model using Solver tool (Microsoft Excel) for determination of respective amino acid isotherms. Equation  $M\% = (X_0 \cdot C \cdot k \cdot A_w) / ((1 - k \cdot A_w) \cdot (1 + (C - 1) \cdot k \cdot A_w))$ , where C and k are constants and X0 the monolayer moisture content. The

obtained  $A_w$  and  $M\%$  from amino acid samples collected in closed bag were: L-lysine 0.44 and 1.56, DL-methionine 0.53 and 0.10, L-threonine 0.50 and 0.05, L-valine 0.51 and 0.14 and L-tryptophan 0.57 and 0.18, respectively. GAB parameters and regression coefficients were: L-lysine  $X_0 = 25.46$   $C = 0.063$   $k = 0.869$   $R^2 = 0.94$ , DL-methionine  $X_0 = 0.052$   $C = 158.12$   $k = 0.957$   $R^2 = 0.76$ , L-threonine  $X_0 = 0.390$   $C = 0.006$   $k = 1.008$   $R^2 = 0.94$ , L-valine  $X_0 = 0.056$   $C = 4659.0$   $k = 1.008$   $R^2 = 0.91$  and L-tryptophan  $X_0 = 0.067$   $C = 2550.5$   $k = 0.982$   $R^2 = 0.94$ . Among

the amino acids evaluated, L-lysine showed the highest hygroscopic characteristics and reached 14.81% of  $M\%$  in an environment condition with RH% of 85%. Therefore, environmental conditions seem to play an important role on the establishment of feed formulations due to inherent hygroscopic properties of the raw material. The adsorption isotherms provides important piece of information regarding the interference of environmental conditions on feed storage.

**Key Words:** feed, GAB model, humidity, water activity