
This study was conducted to evaluate the effects of supplementation of DL-methionine (DLM) and DL-methionine hydroxyl analog (HMTBA) on broiler performance at requirement level based on 2 digestible amino acid recommendations. A total of 512 male Ross 308 birds were randomly assigned according to a 2 × 2 factorial arrangement with main effects being methionine source (DLM, 99%; HMTBA, 88%) and amino acid recommendation (Lemme et al., 2010; Rhodimet Nutrition Guide, RNG, 2013), resulting in 4 treatments with 8 replicates of 16 birds each. The experimental diets were formulated using corn and soybean meal to contain 22.0% CP, 3025 kcal ME/kg, 1.27% or 1.15% digestible Lys, 0.92% or 0.96% digestible TSAA and 0.80% or 0.75% digestible Thr for the starter phase (0 to 12 d of age), 20.0% CP, 3150 kcal ME/kg, 1.09% or 1.16% digestible Lys, 0.81% or 0.90% digestible TSAA and 0.70% or 0.72% digestible Thr for the grower phase (12 to 22 d of age) and 18.0% CP, 3200 kcal ME/kg, 1.00% or 0.98% digestible Lys, 0.76% or 0.75% digestible TSAA and 0.65% or 0.61% digestible Thr for the finisher phase (22 to 35 d of age). The equivalent price on a methionine basis for HMTBA was 88% of DLM. Experimental data were analyzed by ANOVA and Tukey test was applied when necessary. As expected, final body weight, body weight gain, feed intake, FCR and feed cost per gain were not affected by the methionine source over the entire 35 d period. No interaction between methionine source and amino acid recommendation was observed. Feeding birds with diets formulated above the recommended level based on 2 digestible amino acid recommendations, of diets. Dietary Thr above the recommended level (0.77%) improved (P ≤ 0.05) G:F and increased (P ≤ 0.05) intestinal mucin secretion when compared with birds fed with 0.70% Thr. However, intestinal morphology and goblet cell number in the duodenum, jejum and ileum were not affected (P > 0.05) by the experimental diets. Based on these findings, the requirement for dig Gly+Ser in diets with low protein levels containing 0.77% Thr appear to be 1.45% for broilers in the grower period; however, this requirement may be over 1.60% in diets containing 0.70% Thr. Gly supplementation could directly and/or indirectly influence proper functioning of the intestinal mucosa and improve utilization of the energy contained in the diet.

Key Words: amino acid, intestinal mucin, performance

P319  Methionine incorporation into the blood plasma of broiler chickens at the last week of age. A. C. Stradiottia,b, C. Ducatti2, J. A. Bendassolil, J. R. Sartori1, V. C. Pelica1, P. C. Araujo1, C. C. Miranda*, L. V. C. Girão1, F. G. Luiggi1, I. M. G. P. Souza1, P. D. G. Pachecoint1, M. M. Aoyagi1, J. C. Denadai2, M. M. P. Sartorio, A. C. Pezzatoint1, 1São Paulo State University, Federal University of Veterinary Medicine and Animal Science, Botucatu, Brazil, 2São Paulo State University, Institute of Biosciences, Botucatu, Brazil, 3University of São Paulo, Center of Nuclear Energy in Agriculture, Piracicaba, Brazil, 4São Paulo Research Foundation - FAPESP, Brazil.

The use of labeled amino acids associated with the isotope dilution technique can be used for further elucidation on their dynamic in animal nutrition studies by changing the isotopic composition. The goal of this study was to assess the rate of labeled methionine incorporation into the blood plasma of broilers aged 36–42 d-old. A total of 51 one-d-old male Cobb broiler chickens were housed (12 birds/m2 density), and selected with an initial BW of 2.4 ± 0.06 kg. The diet was formulated based on corn and soybean meal. A dosage of 29 µmol of L-[13C1] methionine/kg BW/h was used, administered orally within 6 h (99 atom% 13C, Cambridge isotope Laboratories, Inc.) to promote tissue enrichment. At 0 (control), 0.5, 1, 2, 3, 4, 5, 6, 8, 10, 12, 16, 20, 24, 48, 72 and 96 h after initial dosing, blood plasma samples were collected from 3 birds per time point, by jugular vein puncture, and then lyophilized. Carbon isotopic analysis was obtained using a mass spectrometer. Second order polynomial fit was used to determine the maximum incorporation point, and analyzed by first-order exponential equation [δ13C(t) = δ13C(f)+[δ13C(i)- δ13C(f)]×e-kt], obtained using the statistic software Minitab 16. Maximum enrichment occurred 9.9 h after oral administration of enriched solution, and resulted in the equation: δ13C = -11.31–7.79e-0.1530t (r² = 0.94), with half-life (t = ln2/k) of 4.53 h, representing the velocity of methionine incorporation into embedded tissue. Thus, the time required for 50% of orally administered labeled methionine to be metabolized is approximately 4.5 h at this dose and age of the bird.  

Key Words: labeled carbon, methyl-13C, turnover

P320  Digestible lysine and methionine + cystine levels on carcass yield and morphology of pectoral muscle of broilers at 21 days old. C. H. F. Domínguez*, 1, K. F. Duarte2, T. C. O. Quadros3, E. T. Santos2, D. M. C. Castilhano3, R. H. Marques3, T. G. Petrolli3, M. F. M. Praes1, O. M. Junqueira4, and J. D. Messana2, 1Fundação de Amparo a Pesquisa do Estado de São Paulo (FAPESP), São Paulo, SP, Brazil.

This work studied the effect of Gly supplementation in low-protein diets with different levels of digestible (dig) Thr on performance, development of intestinal mucosa and nutrient utilization of broiler chickens during the grower period (21–35 d). A total of 240 21-d-old Cobb-Vantress male chicks were distributed in a completely randomized experimental design in a 4x2 factorial arrangement, for a total of 8 treatments with 5 replicate pens of 6 birds each. Treatments consisted of 4 dietary levels of dig Gly+Ser (1.30; 1.40; 1.50 and 1.60%) and 2 levels of dig Thr (0.70% and 0.77%, corresponding to 100% and 110% of required Thr, respectively, according to Rostagno et al., 2011). At 35 d, interaction (P ≤ 0.05) was observed between dietary Gly+Ser and Thr levels for gain-to-feed ratio (G:F). There were linear and quadratic effects (P ≤ 0.05) of dietary levels of Gly+Ser on G:F in the diets with 0.70% and 0.77% Thr, respectively. Gly supplementation resulted in linear increases (P ≤ 0.05) on BW gain, G:F, intestinal mucin secretion, apparent digestibility of fat and AMEi of diets. Dietary Thr above the recommended level (0.77%) improved (P ≤ 0.05) G:F and increased (P ≤ 0.05) intestinal mucin secretion when compared with birds fed with 0.70% Thr. However, intestinal morphology and goblet cell number in the duodenum, jejum and ileum were not affected (P > 0.05) by the experimental diets. Based on these findings, the requirement for dig Gly+Ser in diets with low protein levels containing 0.77% Thr appear to be 1.45% for broilers in the grower period; however, this requirement may be over 1.60% in diets containing 0.70% Thr. Gly supplementation could directly and/or indirectly influence proper functioning of the intestinal mucosa and improve utilization of the energy contained in the diet.
The aim of this study was to evaluate different levels of digestible lysine and methionine + cystine on carcass yield and morphology of pectoral muscle of broilers at 21 d of age. A total of 3,200 one-day-old male Cobb × Cobb 500 chicks were used, distributed in a completely randomized design in a factorial arrangement 2 × 5 (2 digestible lysine levels: 1.253 and 1.378% × 5 digestible methionine + cystine levels: 0.812, 0.860, 0.902, 0.947 and 0.992%) and 8 replicates of 40 birds each. At 21 d of age, 480 birds were culled by cervical dislocation to evaluate parameters of carcass yield, breast yield, breast fillet yield, thigh and drumstick yield, wings and back. Calculations of carcass yield were based on live body weight and carcass weight. Live BW was determined individually on platform before slaughter and carcass weight by weighing the eviscerated fowl, without neck, legs and abdominal fat. Length, width, and thickness of the breast fillet were measured for the assessment of pectoral muscle morphology. The data were analyzed by the PROC GLM procedure of SAS (2002) and in case of significance linear regressions were performed. There was no isolated effect (P > 0.05) for the different digestible lysine and methionine + cystine levels for the variables of carcass yield studied, however, an interaction was observed among digestible lysine and methionine + cystine levels for breast fillet width. These results suggest that the digestible lysine level of 1.253% provided greater breast fillet width (avg. 55.77mm) for birds fed with diets containing 0.860% methionine + cystine. However, when the birds were fed with diets containing 0.902% methionine + cystine, the lysine level of 1.378% promoted the best result (avg. 55.30mm). Therefore it is recommended to use digestible lysine and methionine + cystine levels of 1.253% and 0.860% respectively, to achieve better width breast fillet results of broilers at 21 d old with a lower cost of production.

Key Words: digestible amino acid, breast fillet, length