Nutrition IV

115 Evaluation of performance and carcass characteristics of four commercial toxin-binders in groundnut cake based broiler finisher’s diets. O. A. Ogunwolo1, A. Y. Onamade1, M. D. Olumide*1, A. O. Akinsoyinu1, and A. A. Mako2, 1University of Ibadan, Ibadan, Oyo state, Nigeria, 2Tai Solarin College of Education, Ijebu Ode, Ogun State, Nigeria.

The relative efficacy of 4 proprietary toxin-binders and charcoal in Groundnut cake based diets were investigated for broiler production in a trial lasting 6 weeks. Five different diets were formulated. Diet A (control) had no toxin binder while diets B, C, D, E and F had Charcoal, Toxirack, Toxynil, MycofixR Eco and A-Tox respectively which were incorporated at 0.3% in their respective diets. Two hundred and seventy 1-day old Marshall Broiler chicks were brooded on basal (control) experimental diets for 3 weeks. At day-22, they were allotted randomly to the experimental diets such that the mean group weights were similar. Each treatment was in triplicate comprising of 15 birds per replicate. The design of the experiment was a completely randomized design. The birds were fed their assigned experimental diets and water ad libitum for 3 weeks. Records of weight changes, feed consumption and mortality were taken. Three birds were sacrificed from each replicate and were used for assessing the organ weights and carcass characteristics. Data were analyzed using ANOVA and significant means separated (P < 0.05). Variations in values obtained for the average weight gain of the birds, feed and water consumption were significantly (P < 0.05) influenced by the dietary treatments. The feed conversion ratio values were 3.30, 2.96, 3.14, 3.08, 2.62 and 3.15 for birds on diets A, B, C, D, E and F respectively which was highest for the basal (control) diet and lowest for MycofixR Eco. The primal cuts (i.e Drumsticks, Thighs, Breasts) and abdominal fats as percentages of the liveweights were significantly (P < 0.05) harnessed by the inclusion of the toxin-binders compared with control. Heart weight was significantly (P < 0.05) lower for birds on diet D (Toxynil). In this study, the commercial feeds toxin-binders used had variable potency and strength as depicted by the differential performance indices.

Key Words: broiler finishers, toxin-binders, carcass characteristics, organ weights, groundnut cake based diets

116 Effect of screened palm kernel meal in the native hen’s diet on egg production and quality. A. Adrizal*,1, R. Angel2, S. Fakhri1, R. Murni1, Y. Yatno1, and Y. Yusrizal1, 1Faculty of Animal Husbandry, University of Jambi, Jambi, Indonesia, 2Department of Animal and Avian Sciences, University of Maryland, College Park.

A. O. Akinsoyinu1, and A. A. Mako 2, 1University of Ibadan, Ibadan, Oyo state, Nigeria, 2Tai Solarin College of Education, Ijebu Ode, Ogun State, Nigeria.

Grittiness caused by nutshell contamination in palm kernel meal (PKM) was reported to limit PKM utilization in chicken’s diet. This study evaluated if screening of PKM could minimize this effect on hen’s performance, egg production, and egg quality (albumen height, haugh unit, and yolk color score). Experimental diets were a corn-soybean meal based-diet and 3 other diets containing 15% PKM (each was screened to pass 1.5 mm [PKMmix], 1 mm [PKMfine], and > than 1mm sieve [coarse], respectively). Diets were randomly assigned to 60 cages with one 66-<wbr/>wk-old native hen per cage, each treatment consisted of 15 replicate hens. Diets were formulated to be isocaloric (2,700 kcal/kg) and contained 17.5 to 18.4% CP. Contrast orthogonal test showed that 5-wk feed intake of hens receiving PKM diets was greater than those given the PKMfine or PKMcoarse (3,105 vs. 3,266 vs. 3,264g/hen), but no difference between the PKMmix and PKMcoarse. However, feeding hens PKM diets did not affect feed conversion ratio compared with feeding hens a control diet, and resulted in comparable response with control fed hens in egg production and quality traits including yolk color score (8.2 vs. 7.5 vs. 7.7 vs. 7.0 for the control, PKMmix, PKMfine, and PKMcoarse, respectively; P = 0.06).

Key Words: screened palm kernel meal, native hen, feed intake, feed conversion, egg quality

117 Phytase efficacy in broiler chickens when feed was treated with a formaldehyde based product. G. A. Gomes*1, T. T. Santos1, C. Wyatt1, and L. F. Araújo2, 1AB Vista Feed Ingredients, Marlborough, Wiltshire, United Kingdom, 2Universidade de São Paulo, Pirassununga, SP, Brasil.

An experiment was carried out to evaluate the effects of a broiler feed treated with a formaldehyde based product (FBP) upon in vivo efficacy of different phytases. 450 one day old male Cobb 500 chicks were allotted to 50 environmentally controlled brooder batteries with continuous lighting, and then randomly assigned in a 5x2 factorial arrangement. All diets were corn-soybean meal based and formulated to meet or exceed the requirements of broilers from 0 to 20d old (ROSTAGNO et al., 2005) except for Ca and AvP. The treatments consisted of a Positive Control diet (PC - 0.45% AvP, 0.90% Ca), Negative Control diet (NC - 0.22% AvP, 0.75% Ca), NC + Enhanced E. coli (EEC), NC + Wild E. coli (WEC) and NC + Aspergillus-derived phytase (ADP), with or without FBP inclusion (3kg/ton). Representative feed samples were collected from all the treatments, and then subjected to analysis of phytase activity by the AOAC methodology. At 20d of age BWG, FI, FCR and tibia ash were measured. Birds fed with NC diets showed a significant reduction (P < 0.05) on all performance and bone ash measurements. The birds fed with FBP-treated feeds gave a slightly decreased BWG (P > 0.05) and increased FI (P > 0.05), and thus had a poorer FCR (P = 0.016; 1.411 vs. 1.373 for birds fed with diets with or without FBP, respectively). In vitro analysis of phytases showed that the treatment of feeds with FBP caused a dramatic reduction on analyzed phytases activities (reduction of 83%, 73% and 24% for EEC, WEC and ADP, respectively). Birds that received diets containing microbial phytases showed improved performance and bone mineralization when compared with NC fed birds (P < 0.05) regardless of FBP treatment. When compared with birds fed PC diets, birds fed with NC + microbial phytases showed similar responses on performance parameters (P > 0.05) but lower tibia ash content (P < 0.05). In vivo efficacy of different phytases was not affected by FBP product inclusion even though the in vitro analysis found low activity levels.

Key Words: phytase, formaldehyde, broiler

118 Influence of calcium source and phytase on performance and tibia ash of broilers fed corn soy diets varying in calcium content. M. R. Bedford*1, C. L. Wyatt1, D. O’Gorman2, and C. L. Wyatt1, 1AB Vista Feed Ingredients, Marlborough, Wiltshire, United Kingdom, 2Celtic Sea Minerals, Carrigaline, Cork, Ireland.

A total of 864 male Cobb x Cobb broilers were fed a corn soy based diet from 0 to 18d of age varying in Ca and AvP content, Ca source and phytase activity. Three sources of calcium (Calcium glycerate, Lime-stone or a calcified seaweed source (CSM)) were used to supply 0.6, 0.8 or 1.0 percent total calcium in a fixed 2:1 ratio with AvP. Each of these diets was supplemented with either 0 or 500 FTU of a modified

Key Words: phytase, formaldehyde, broiler

Influence of calcium source and phytase on performance and tibia ash of broilers fed corn soy diets varying in calcium content.
E. coli phytase (Quantum XT) and each diet was replicated 6 times with 8 birds per replicate. All diets (pelleted at 75°C) and water were offered ad libitum. Gain, intake, FCR and tibia ash were determined at 18 d of age. Intake and gain were subject to a phytase by Ca source interaction, which was as a result of the presence of phytase giving far greater benefits in the presence of the CSM compared with the other phytase sources. Tibia ash as a percent and total weight was subject to a 3-way interaction which was interpreted as the phytase giving optimal performance in the 0.8% Ca diet only when the Ca source was CSM. 1.0% Ca from limestone plus phytase was required to equilibrate performance with the 0.8% CSM phytase diet, whereas bone parameters were always suboptimal in birds fed the Ca glyc erate source regardless of calcium level or phytase supplementation. The data suggest that simply formulating to a total calcium level in broiler diets is not adequate for predicting performance if calcium is to be derived from different sources. A digestible calcium metric is suggested. It is also concluded that the requirements for calcium may be significantly lower than NRC recommendations provided a highly available source is used in conjunction with an appropriate phytase.

Key Words: calcium, phytase

119 Influence of diet, phytase, incubation time, and particle size on gastric Ca and P solubility. C. L. Walk1,2, A. P. McElroy1 and M. R. Bedford1,2, Virginia Tech, Blacksburg, 2AB Vista Feed Ingredients, Marlborough, Wiltshire, United Kingdom.

An in vivo and a series of in vitro trials were conducted to determine the influence of diet, phytase, incubation time, and particle size on gastric Ca and P solubility. Experimental diets were formulated to contain 0.89% Ca and 0.40% aP (positive control; PC) or 0.76% Ca and 0.27% aP (negative control; NC). The PC was supplemented with 1000 FTU/kg and the NC with 1000 and 5000 FTU/kg diet of microbial phytase, which resulted in a total of 5 experimental diets. The diets were fed to 2,940 Cobb 500, male, broilers from d 0 to 18. Digesta was collected from the gizzard and ileum at d 18 to determine Ca and P digestibility. For the in vitro trials, diets were ground to pass a 1 or 2 mm screen and exposed to a gastric digestion containing HCl and pepsin. In vivo phytase supplementation increased (P < 0.05) gizzard Ca solubility in the NC diet, but did not affect (P > 0.05) gizzard P solubility. Conversely, phytase improved (P < 0.05) apparent ileal P digestibility, but did not affect (P > 0.05) Ca digestibility. Gastric P (P < 0.05) and Ca (P < 0.05) solubility was increased in diets ground to pass a 1 mm screen compared with diets ground to pass a 2 mm screen. Phytase at 5000 FTU/kg in the NC and 1000 FTU/kg in the PC increased gastric P and Ca solubility compared all other diets ground through a 2 mm screen. Phytase continued to release P (P < 0.05) in the gastric test over time, but Ca solubility reached an asymptote at 5 min. In conclusion, considerable Ca and P digestion occurs within 5 min of gastric digestion, but the kinetics of release are different. Particle size and residence time in the gastric phase of digestion may play a critical role in the rate of Ca and P dissolution and utilization. In addition, the non-parallel rate of Ca and P release in the gastric phase suggests that the absorption/utilization of these minerals may be complicated by differential rates of delivery to the small intestine. Furthermore, the negative digestibility of Ca in transit through the ileum may be the result of pH shifts coupled with precipitation with dietary chelators.

Key Words: calcium, phosphorus, phytase, gastric digestion

120 Turkey performance between 0 and 84 d added with high doses of phytase. M. Bedford1, C. Wyatt1, A Knox2, and T. T. Santos3, 1AB Vista Feed Ingredients, Marlborough, United Kingdom, 2Roslin Nutrition Ltd.

Phytase is being commercially used worldwide to improve phosphorus availability/digestibility from vegetable sources. As phytate, phytase substract, is an anti-nutritional component high doses of phytase could be used to reduce this anti-nutritional effect and improve animal performance besides the phosphorous release. An experiment was carried out to evaluate the effects of high doses of phytase at turkey feed with low decrease of calcium and phosphorus content. 1500 d old male and female BUT 8 poults were allotted at 60 pens and distributed at random to 6 experimental treatments 10 replicates each (5 males and 5 females). Treatments consisted in a Positive Control, Negative Control (−0.15% Av P and −0.15% Calcium) and negative control added with 250, 500, 1000 or 2000FTU/kg phytase activity (Quantum Phytase). Each treatment consisted into 3 diets that met nutritional requirement, also, feed samples were collected and enzyme activity analyzed to confirm it met the expected activity. Body weight gain and feed consumption were measured at 28, 56 and 84d of age and feed conversion corrected by mortality was calculated at same ages. At 84d males and females fed the NC had lower body weight gain compared with the PC (8662 vs 9204 and 6280 vs 6491, P < 0.05); 500FTU of phytase recovered body weight gain corrected with the PC and 1000 on female and 2000FTU on both sex had higher body weight gain compared with PC (9141 and 9505 on males and 6588, 6734 and 6809 on female, P < 0.05). NC got worst feed conversion compared with PC and 500 to 2000FTU of phytase inclusion recovery feed conversion to level similar to PC on both males and females. High dosages of phytase can be used on turkey diets marginally deficient on phosphorus to improve animal performance compared with a regular diet. Improvement of performance would be related to the reduction of the anti-nutritional effect of phytate and not to phosphorus release.

Key Words: phytase, turkey, performance, phosphorus, calcium

121 Dietary sodium level and exogenous phytase interactive effects on growth performance and carcass characteristics of broilers. E. J. Kim1, A. Corzo2, C. Price3, and W. A. Dozier, III4, USDA-ARS, Poultry Research Unit, Mississippi State, MS, Mississipi State University, Mississippi State, 3Sanderson Farms, Laurel, MS, 4Auburn University, Auburn.

The objectives of this study were to examine the interactive effects of dietary phytase and Na in broiler growth and meat yields from 1 to 49 d of age. Five hundred and 76 Ross × Ross 708 mixed-sex broilers were randomly distributed to 48 floor pens (6 replicate pens per treatment; 0.09m2/bird) and fed 8 dietary treatments. Treatments were arranged in a 2 × 4 factorial with 4 levels of Na (ranging from 0.11 to 0.23% in 0.04% increments) with or without phytase and provided throughout the entire 49 d production period. Diets were formulated to meet all nutrient requirements for each feeding phase with the exception of Na. At 49 d of age, 8 birds per pen were processed and deboned to determine carcass characteristics. Body weight, feed consumption, mortality, carcass weight, abdominal fat weight, abdominal fat percentage, total breast meat weight, and total breast meat yield were determined. Dietary phytase and Na did not interact with the variables measured throughout the experimentation; hence, only main effects of Na were statistically significant. Broilers fed gradient levels of Na had quadratically higher (P < 0.05) BW gain and feed intake throughout all feeding phases. In relation to BW gain, carcass weight, breast fillet weight, and total breast meat were also significantly (P < 0.05) increased quadratically with incremental Na supplementation resulting in an optimum inclusion level of 0.15 to 0.19%. Broilers fed diets containing 0.11 or 0.23% Na were found to adversely affect growth performance.
and carcass characteristics. The addition of phytase did not improve ($P \leq 0.05$) live performance and carcass characteristics. The results of this study indicate that dietary Na may have significant effects on growth and carcass characteristics in broilers.

**Key Words:** phytase, sodium, broilers

122 Effects of feeding various levels of nonphytate phosphorus (nPP) in the starter phase on growth performance and bone characteristics in broilers during subsequent phases. S. Powell,* T. D. Bidner, and L. L. Southern, Louisiana State University Agricultural Center, Baton Rouge.

Two experiments were conducted to investigate the effect of feeding marginally deficient or excess P in the starter phase on growth and bone responses of broilers in subsequent phases. Ross 708 broilers were used in a phased feeding program: starter (0 to 14 d or 21 d), grower (14 to 28 d or 21 to 35 d), and finisher (35 to 49 d). Diets were corn-soybean meal based and adequate in all nutrients except Ca and P where appropriate. Treatments had 12 replications of 35 broilers in the starter phase, 6 replications of 23 to 26 broilers for the grower phase, and 6 replications of 20 broilers in the finisher phase. In the starter phase, broilers were allotted to treatments with nPP levels ranging from 0.40 to 0.60% with a Ca:nPP of 2.2:1 (Exp. 1) and 0.50 or 0.60% nPP with a Ca:nPP of 1.9:1 (Exp. 2). For the grower phase, broilers from each treatment in the starter phase were divided into 2 groups and fed either 0.30 or 0.35% nPP. Broilers were fed a common diet in the finisher phase (Exp. 2). In Exp. 1, broilers fed the lower levels of nPP in the starter phase gained more when fed 0.30% nPP in the grower phase, while broilers fed the higher levels of nPP in the starter phase gained more when fed 0.35% nPP in the grower phase ($P = 0.05$). In Exp. 2, feeding 0.60% nPP in the starter phase decreased ($P = 0.03$) ADG and increased tibia ash ($P < 0.01$) in the starter phase. During the grower phase, broilers fed 0.50% nPP in the starter phase had higher ADG ($P = 0.05$) and G:F ($P = 0.08$). Similarly, broilers fed 0.30% nPP in the grower phase had higher ADG ($P = 0.05$) and G:F ($P = 0.07$). However, bone breaking strength was higher ($P = 0.03$) at the end of the grower phase in broilers fed 0.60% nPP in the starter phase. In the overall growth data, G:F was higher ($P = 0.02$) for broilers fed 0.50% nPP in the starter phase than for those fed 0.60% nPP. These data indicate that feeding below the nPP requirement for 0 to 21 d resulted in better adaptation to a lower nPP in later phases while feeding above the nPP requirement for 0 to 21 d resulted in a decrease in G:F.

**Key Words:** broiler, phosphorus, compensation


A feeding trial lasting 6-week was conducted using 270 d-1 Marshal Broiler chicks to evaluate the effects of inclusion of 4 different commercial toxin-binders on the haematology and the liver serum enzymes in groundnut cake based broiler finishers’ diets. Diet A (control) had no commercial toxin binder while diets B, C, D, E and F had charcoal, Toxirax, Toxynil, MycofixR Eco and A-Tox respectively each incorporated at 0.3%. The birds were initially brooded on basal (control) diet till day-22. They were thereafter randomly allocated to 6 treatments in triplicate and each replicate made of 15 birds such that the mean group weight was statistically similar. The experiment was a completely randomized design. The birds were fed their assigned diets and water ad libitum for 3-week. Blood were collected from the birds through jugular vein into bottles with anti-coagulant for hematological indices while other sets were in the bottle without EDTA for serum separation and liver enzymes quantification. Data collected were analyzed using ANOVA and the significant means separated. Values obtained for white blood cell, packed cell volume, hemoglobin and mean cell hemoglobin concentration were all within standard range for broilers. Red blood cell value for birds on control diet was lowest ($P < 0.05$) while the highest value was obtained in birds on treatment E (MycofixR Eco). Serum liver transferences i.e ALT and AST(i.u/L) ranged between 6 and 22–8.01 and 29.85–50.10 respectively, was lowest for birds on diet F and highest for birds on control diet. Thus, the proprietary binders in this study had variable effects on the hematology and serum profile of birds.

**Key Words:** groundnut cake, toxin-binders, broiler finishers’ diets, hematology, serum liver enzymes

124 Studies on nutritive value of cassava root products as energy sources in poultry production. O. O Tewe* and M. A Mososalaje, Department of Animal Science, University of Ibadan, Ibadan.

Contrasting reports are available on the metabolisable energy and nutrient composition of cassava root meals. Nutritionally balanced diet requires adequate knowledge of nutritive value of the ingredients. This study was carried out to determine true metabolisable energy (TME), hydrogen cyanide and proximate composition of 4 cassava root products (CRPs), a year old whole cassava tubers were processed into 4 products: peeled cassava chips (PCC); unpeeled cassava chips (UCC), unpeeled cassava pellets (UCP) and unpeeled cassava grits (UCG). The 4 products were analyzed for proximate composition, hydrogen cyanide and TME using 15, 10-week adult broilers. There were 3 birds each on the 4 CRPs and the remaining 3 birds were fasted. Excreta were collected after 24-h, dried, weighed and analyzed. Proximate analysis revealed that crude protein of content of unpeeled cassava products: UCC (4.06), UCP (4.62) and UCG (3.22), were significantly ($P < 0.05$) higher than that of PCC (1.54%), crude fiber and cyanide content of UCP and UCG (7.87% and 35.34 ppm; and 5.95% and 39.36 ppm) respectively were significantly ($P < 0.05$) lower than UCC (9.95% and 51.08 ppm) and significantly ($P < 0.05$) higher than PCC (1.30% and 19.14 ppm) respectively. Dry matter, NFE and ash contents were similar ($P > 0.05$). Result obtained on TME showed that energy yield of CRPs were not significantly ($P > 0.05$) different. The TME of the 4 CRPs were similar ($P > 0.05$), 3.22 Kcal/g, 3.17 Kcal/g, 3.29 Kcal/g and 3.28 Kcal/g were recorded for PCC, UCP and UCG respectively. Cost of production of UCC was the lowest while that of UCP was the highest. The TME of CRPs were comparable to that of maize. Proximate composition of unpeeled cassava products shows they are promising in livestock feeding.

**Key Words:** cassava root products, energy, nutritive values, poultry production, proximate analysis


BMD (bacitracin methylene disalicylate) is traditionally used as an antibiotic growth promoter in broiler feeds. As poultry producers seek alternative products to support gut health, choices include products with natural nutraceutical ingredients. NutriFibe Complex was developed to promote gut health and immunity. The formulation combines prebiotic fibers, β glaucans and yucca to promote a desired microflora balance, natural nutraceutical ingredients. NutriFibe Complex was developed to promote gut health and immunity. The formulation combines prebiotic fibers, β glaucans and yucca to promote a desired microflora balance,
modulate the immune system and enhance gut integrity. In this study, NutriFibe Complex was substituted for BMD in broiler diets on 2 separate farms. One farm produced 6 lb. birds (Farm A) and the other produced 8 lb. birds (Farm B). Two of 4 houses on each farm received the usual corn-soy rations with BMD. The other 2 houses received the same ration but BMD was replaced with NutriFibe Complex. All other feed additives were the same in both diets. All birds were vaccinated for coccidiosis control. Built up litter was present in all houses. On Farm A (6 lb.), birds fed the diet containing NutriFibe Complex performed as well or better than BMD (Table 1). NutriFibe Complex-fed birds were 0.11 lb. heavier than controls, and feed efficiency was improved by 0.9 pts. Survival was similar in both groups. The farm sold an additional 5,400 lb from houses fed NutriFibe Complex compared with control houses. On Farm B (8 lb.), birds fed NutriFibe Complex performed as well as the control group. Final weight, average daily gain, feed efficiency and survival were similar in both groups. This trial shows that NutriFibe Complex delivered the same high performance that is expected from BMD. Tray pack birds (6 lb.) fed NutriFibe Complex had better weight gain and feed efficiency than the BMD group. These encouraging results demonstrate that optimizing gut health pays off in performance and survival.

Table 1. Effects of NutriFibe Complex (NFC) or BMD (control) on broiler performance

<table>
<thead>
<tr>
<th>Trait</th>
<th>Farm A Control</th>
<th>Farm A NFC</th>
<th>Farm B Control</th>
<th>Farm B NFC</th>
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<tr>
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<td>No. sold</td>
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<td>48,753</td>
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<td>Final wt. (lb.)</td>
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<td>8.56</td>
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<tr>
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</table>

Key Words: prebiotic fiber, gut health, broiler performance, antibiotic alternative, BMD

127 Effects of adding dietary guar meal, guar gum and saponin-rich guar meal extract on broiler chicks challenged with Clostridium perfringens. S. Hassan1, J. McReynolds2, J. Byrd2, A. Cartwright3, and C. Bailey3, 1King Faisal University, Al-Ahsa, Kingdom of Saudi Arabia, 2USDA, Agriculture Research Center, College Station, TX, 3Texas A&M University, College Station.

Three hundred one-d-old broiler chicks were randomly distributed among 5 treatments with 3 replicates of 20 chicks per replicate. Chicks were assigned to one of the following treatments: 1) Unchallenged control, chicks fed broiler starter diet containing 55% wheat (control diet) but unchallenged with Clostridium perfringens type A, 2) challenged control, chicks fed control diet and challenged with Clostridium perfringens type A, 3) chicks fed control diet containing 2.5% guar meal and challenged with Clostridium perfringens type A, 4) chicks fed control diet containing 1% guar gum and challenged with Clostridium perfringens type A, and 5) chicks fed control diet containing 0.125% saponin-rich guar meal extract and challenged with Clostridium perfringens type A. Weekly body weight, feed intake and mortality rate were recorded from 0 to 21 d of age. Chicks were challenged at 14d and 21 d of age, necropsies were performed for each chick of all the treatments and intestinal lesion score and the colony forming unit concentrations of Clostridium perfringens of the sample of gastrointestinal contents were examined. Challenge by Clostridium perfringens in this study was unsuccessful and did not result in necrotic enteritis. Body weights at 21 d, and body weight gains during 14 to 21 d and 0 to 21 d in chicks challenged and fed 2.5% guar meal or 0.125% saponin-rich guar meal extract were significantly lower than those of both unchallenged and challenged control treatments during the same periods. Weekly feed conversion ratio of chicks challenged control treatment and fed 0.125% saponin-rich guar meal extract were higher than those of both challenged and unchallenged control treatments, but not different from the guar meal and saponin fed treatments during the 15 to 21 d period. Results suggest that unknown chemical component in saponin-rich guar meal extract such as saponin, interaction between saponin and the guar meal residue or trypsin inhibitor or some unknown toxic substances could be contributed to the observed inhibition of growth in chicks fed saponin-rich guar meal extract.

Key Words: chicken, Clostridium, guar gum, guar meal, saponin

128 Poultry feed formulation results from different digestible amino acid databases. M. Tahir1, P. Sodsee2, and G. M. Pest12, 1Agricultural University, Peshawar, Khyber Pakhtunkhwa, Pakistan, 2University Georgia, Athens.

This study showed how the different database values influence ingredient usage and feed cost for broiler, layer and turkey diets with recent ingredient costs from the USA and Pakistan. A series of feeds were formulated to compare results from using 2 commercial ingredient composition databases: Ajinomoto Heartland (AH, rooster) and Evonik Degussa (ED, chick). Total amino acids averaged 6% higher in the AH (rooster) than ED (chick) database and digestible amino acids averaged...
14% higher in the rooster than chick assays. The ingredient composition matrix was based on NRC (1994) tables except for digestible amino acid and protein. Requirements were for a broiler starter (Ross), broiler finisher (Cobb), turkey starter (Nicholas), turkey finisher (BUT males), and layer prelay and peak (Hy-line) diets. Costs were local market prices in Pakistan (June 2010) and average USA prices (2009). Formula costs were higher using the ED digestible amino acid values, ranging from $0.90/ton for the turkey finisher to $8.20/ton for the turkey starter. The broiler starter and finisher diets were $6.00 and $2.40/ton higher using the ED digestible amino acid values. Differences in formulation costs were due to higher levels of supplemental amino acids and soybean meal when using the ED database. The shadow prices of distillers dried grain with soluble (DDGS) ranged from $199.30/ton in the turkey starter with AH digestible amino acid values to $245.40/ton in the prelay diet with AH digestible amino acid values. Not knowing the digestible amino acid levels in feed ingredients or choosing inappropriate digestible amino acid values may result (at least) in inefficiencies of 3 to 4 $/ton of finished feed for broilers, layers and turkeys. Comparative values are similar for dollar ($) and rupees (Rs). Differences in feed cost from using the different digestibility values can give an estimate of potential savings (costs) from using a particular database. The cost difference may be used to demonstrate the magnitude of research monies that should be dedicated to most accurately estimating amino acid digestibility values.

Key Words: amino acids, broiler, layer, turkey, cost

129 Effects of functional oils on performance, apparent metabolizable energy and intestinal morphometry in broiler chickens. A. Murakami1, C. Eyn1, and J. Torrent*2, 1University Estadual de Maringa, Maringa, PR, Brazil, 2Oligo Basics Agroind. Ltda., Cascavel, PR, Brazil.

The effects of supplementing a commercial mixture of functional oils (Essential, Oligo Basics Ltda., Cascavel, PR, Brazil; active ingredients: cashew nut shell oil and castor oil), on performance parameters, apparent metabolizable energy (AME), nitrogen corrected AME (AMEn) and intestinal morphometry were evaluated in chickens. A total of 594 one day old chicks with an average initial weight of 44 g were sorted by weight and randomized among 18 floor pens with 33 chicks per pen and were assigned to a control and supplemented treatment. Performance parameters were measured at 14, 28 and 42 d of age. AME and AMEn were determined during 20 to 25 d of age through total fecal collection using 7 replicates with 9 birds per replicate for each treatment. To evaluate the morphometry of the intestinal mucosa, 4 cm of duodenum, jejunum and ileum were taken from 2 chickens of each treatment at 7, 14, 21 and 28 d of age. In the performance study, there was a tendency for better feed conversion at 42 d for the supplemented birds (1.806 vs. 1.772; P = 0.08). Also, diets supplemented with the functional oils yielded higher AME (2,881 vs. 2,777 kcal/kg; P = 0.003) and AMEn (2,568 vs. 2,449 kcal/kg; P = 0.001). Supplementation increased villus height in the duodenum at 14 d of age (554 vs. 715 μm; P < 0.05), crypt depth in the jejunum at 28 d of age (128 vs. 132 μm, P < 0.05) and villus height/crypt ratios (P < 0.05) in the duodenum at d 28, in the jejunum at d 7 and in the ileum at d 14. In conclusion, supplementation with functional oils improved the apparent metabolizable energy of the supplemented diets and changed the intestinal morphometry of the supplemented birds.

Key Words: functional oils, AME, intestinal morphometry