

Nutrition IV

M80 Apparent metabolizable energy of glycerin for broiler chickens. W. A. Dozier III^{*1}, B. J. Kerr², A. Corzo³, M. T. Kidd³, T. E. Weber², and K. Bregendal⁴, ¹USDA-ARS Poultry Research Unit, Mississippi State, MS, ²USDA-ARS Swine Odor and Manure Management Research Unit, Ames, IA, ³Mississippi State University, Mississippi State, ⁴Iowa State University, Ames.

Crude glycerin is a co-product from biodiesel production. In 2006, approximately 250,000 million gallons of biodiesel were produced, which translates to 75,000 metric tons of glycerin. Glycerin contains approximately 3,650 kcal/kg of gross energy and, as such, it may be a potential dietary energy source for poultry. Three energy balance experiments were conducted to determine AME_n of glycerin using broiler chickens of diverse ages. In experiment (Exp.) 1, 2 dietary treatments were fed from 4 to 11 d of age. Dietary treatments consisted of a control diet (no added glycerin) and a diet containing 6% glycerin (94% control diet + 6% glycerin). Four dietary treatments were provided in Exp. 2 (from 17 to 24 d of age) and 3 (from 38 to 45 d of age). Diets in Exp. 2 and 3 were: 1) control diet (no added glycerin); 2) 3% added glycerin (97% control diet + 3% glycerin); 3) 6% added glycerin (94% control diet + 6% glycerin); 4) 9% added glycerin (91% control diet + 9% glycerin). Diets in Exp. 1 and 2 were identical. The diet used in Exp. 3 had reduced nutrient levels based on bird age. In Exp. 2 and 3, broilers were fed 91, 94, 97, and 100% of ad libitum intake so that differences in AME_n consumption were only due to glycerin. A single source of glycerin was used in all experiments.

In Exp. 1, AME_n determination utilized the difference approach by subtracting AME_n of the control diet from AME_n of the test diet. In Exp. 2 and 3, AME_n intake was regressed against feed intake with the slope estimating AME_n of glycerin. Regression equations were $Y = 3,331x - 72.59$ ($P \leq 0.0001$) and $Y = 3,349x - 140.18$ ($P \leq 0.0001$) for Exp. 2 and 3, respectively. The AME_n of glycerin was determined as 3,621, 3,331, and 3,349 kcal/kg in Exp. 1, 2, and 3, respectively. The average AME_n of glycerin across the 3 experiments was 3,434 kcal/kg, which is similar to its gross energy content. These results indicate that AME_n of glycerin is utilized efficiently by broiler chickens.

Key Words: Broiler, Mmetabolizable energy, Glycerin

M81 DDGS in laying hen diets: Virginiamycin residue analysis using the enzyme linked immunosorbent assay procedure. E. C. Hale III^{*}, *Rose Acre Farms, Seymour, IN.*

Virginiamycin is commonly used to control the presence of unwanted microbes during industrial ethanol production.

US Food and Drug Administration (FDA) regulations state that Virginiamycin residue in laying hen feed or feed components is an adulterant. Feeding laying hens a ration containing measurable levels of Virginiamycin residues is against FDA regulations. FDA regulatory language does not differentiate between active and inactive Virginiamycin residues as an adulterant. The microbial inhibition test method generally used by the FDA identifies only active Virginiamycin residues.

The heat used to dry DDGS is thought to render Virginiamycin inactive. Other than general manufacturer specifications indicating that Virginiamycin is stable up to at least 200 degrees F, no data exists on the relationship between heat and inactivation or outright destruction of Virginiamycin.

Because of the ambiguity in FDA regulations regarding what constitutes Virginiamycin residues, DDGS samples were subjected to Enzyme Linked Immunosorbent Assay (ELISA) test procedures to determine the presence of Virginiamycin residues, whether active or inactive.

Twelve (12) samples of DDGS from five different suppliers were tested, and of the twelve samples tested, five returned a positive result for the presence of Virginiamycin above the test detection limit of 0.5 ppm.

Key Words: Laying hen, Virginiamycin, DDG, Ethanol, Food and Drug Administration

M82 Influence of narasin on broiler live performance and yield during the withdrawal period. K. S. Macklin and J. B. Hess^{*}, *Auburn University, Auburn, AL.*

In this trial, live performance and processing yield were assessed in broilers fed Narasin during the withdrawal period. Seeder birds (20% stocking rate) were placed in each pen and raised for 10 days at which time they were challenged with *E. acervulina* (100,000 sporulated oocytes), *E. maxima* (20,000) and *E. tenella* (2,500) via oral gavage. Seeders occupied the pens for 14 days and were removed 4 days prior to trial initiation. Each treatment was fed to 8 pens of 50 female broilers. Birds were fed one of the 4 treatments in a 3 feed program. Starter feed was fed to 14 days, grower from 14 to 28 days and withdrawal from 28 to 49 days. Starter and grower feeds contained Narasin at 72 g/ton. Withdrawal treatments included an unmedicated control, Narasin at 72 g/ton, Narasin at 54 g/ton and Virginiamycin at 15 g/ton. Body weights, feed consumption, feed conversion and mortality were calculated at 14, 28 and 49 days. Ten birds per pen were processed at 50 days for carcass and parts yield determination. Chilled carcass weight, leg, fillet and tender weights and yields were determined after deboning.

Withdrawal treatments did not influence final body weight, feed consumption, feed conversion or cumulative mortality. Lean carcass yield was improved with coccidiostat or virginiamycin in the withdrawal (Control, 71.7%; Narasin 72, 72.9%; Narasin 54, 73%; Virginiamycin 15, 73.2%). Improvements in fillet yield were not significant at 0.35% of live weight (Control, 18.07%; Narasin 72, 18.42%; Narasin 54, 18.27%; Virginiamycin 15, 18.41%). Compared to a withdrawal program with no feed additives, feeding Narasin in the withdrawal feed improved lean carcass yield in broilers.

Key Words: Broiler, Coccidiostat, Withdrawal, Narasin

M83 Identification of an inflammatory compound for chicks in soybean meal. N. M. Dale^{*1}, D. M. Anderson², and H. Hsiao², ¹University of Georgia, Athens, ²ChemGen Corp, Gaithersburg, MD.

An extensive literature exists linking microbial structures containing mannose to the generation of an innate immune response. Mannose containing compounds are membrane or cell wall components of numerous pathogens, and are recognized by pattern recognition receptors that initiate an innate immune response. It has been suggested that mannose containing compounds in certain feed ingredients including soybean meal (SBM) may have enough structural similarity to microbial mannose compounds such that they also stimulate an innate immune response. If so, such a response would be pointless and depress productivity.

Two experiments (Exp) were conducted to explore whether β -galactomannan (β -mannan) in SBM stimulates an innate immune response in chickens. SBM is the principal source of mannans in most practical feeds. Plasma levels of the acute phase protein AGP were used to reflect the degree of innate immune response. In both Exp mixed sex broiler chicks were reared to 14 days of age in battery brooder units.

In Exp 1, test diets contained 27, 24, or 0% SBM, the final ration either with or without 2% guar gum, a rich source of β -mannan. These latter two diets contained isolated soy protein (ISP) to provide the same amino acid composition as the SBM feeds but with little β -mannan. Plasma AGP levels were significantly reduced (less immune response) by removing SBM, but significantly increased when guar was added. In Exp 2, diets contained 34, 17 or 0% SBM, again employing ISP. Each diet was prepared with and without 100 units/g of β -mannanase enzyme (Hemicell[®], ChemGen Corp.). A positive relationship was again seen between levels of SBM and AGP, confirming the effect seen in experiment 1. Enzymatic hydrolysis of β -mannan consistently, but not significantly, reduced AGP in chicks receiving SBM.

It is concluded that diet formulation can stimulate an innate immune response, and that β -mannan in SBM (or guar) appears to be a causative agent. Plant derived β -mannan can thus be considered to be a PAMP (pathogen associated molecular pattern) analog for poultry, engendering a metabolically expensive over-stimulation of the innate immune system.

Key Words: Soybean meal, Acute phase proteins, Broilers, Mannan

M84 The effect of supplemental guanidino acetic acid in Brazilian type broiler diets at summer conditions. J. Ringel^{*1}, A. Lemme¹, and L. F. Araujo², ¹Evonik Degussa GmbH, Hanau, Germany, ²University of Sao Paulo, Sao Paulo, Brazil.

Guanidino acetic acid (GAA) is naturally occurring in animal tissues playing a major role in the energy metabolism as a precursor of creatine. The objective of the study was to examine potential effects of GAA (CreAMINO™) supplementation in purely vegetable diets compared to a positive control. Therefore a total of 780 male ROSS 308 broiler chickens were assigned to one of the following three diets: positive control (6% meat and bone meal), negative control (vegetable diet) and a vegetable diet supplemented with 0.6 g CreAMINO™/kg feed. Performance parameters were recorded from day 14 to day 35 and at the end of the experiment 5 chickens per pen (26 pens) were utilized for carcass quality determination in terms of carcass percentage, breast yield, leg yield, wing yield and abdominal fat yield. Additionally, meat quality in breast meat samples including pH, color, drip loss was measured. Overall weight gain of the broilers did not differ between positive control and the CreAMINO™ supplemented diet while broilers fed the purely vegetable diet showed significantly lower weight gain ($p < 0.05$). Feed conversion was significantly lower in the treatment with CreAMINO™ supplementation compared to both positive and negative control ($p < 0.05$), while mortality remained unaffected by treatment. Only numeric differences between treatments for carcass quality could be determined. Furthermore pH, drip loss, tenderness evaluation and lightness (L^*), yellowness (b^*) did not show any effect, only redness (a^*) was found to be lower in the CreAMINO™ treatment. It can be concluded that supplementation of CreAMINO™ in purely vegetable diets improves broiler performance to levels achieved with a diet containing meat and bone meal, while carcass and product quality are not affected by supplemental CreAMINO™.

Key Words: Guanidino acetic acid, Broiler, Vegetable diets, Feed conversion, Meat quality

M85 Productive parameters in broiler chicks vaccinated against coccidiosis and with a diet that has yeast cell walls (Saccharomyces cerevisiae) added. R. Morales^{*1}, A. García¹, F. García¹, S. Solorio¹, and J. Arce², ¹Safmex S.A. de C.V., Toluca, México, ²UMSNH. Morelia, Michoacán, México.

Two-thousand two-hundred, one-day-old broiler chicks were maintained in production until 45 days of age, completely randomized in seven treatments with six replicates (treatments 1, 4, 5, 6 and 7) and seven replicates (treatments 2 and 3) of 50 birds each: T-1) Negative control without coccidiostat (NC); T-2) Positive control with coccidiostat (PC); T-3) NC + coccidiosis vaccine; T-4) NC

+ *S. cerevisiae* cell walls (YCW or Saf-Mannan®) (600 mg/kg feed); NC + YCW (750 mg/kg feed); T-5) NC + YCW (600 mg/kg feed) + coccidiosis vaccine; T-6) NC + YCW (750 mg/kg feed) + coccidiosis vaccine. Final results at 45 days, showed that broilers that received YCW, at different doses, with and without vaccine had similar body weights when using coccidiostat ($P < 0.05$) (2433b; 2626^a; 2397b; 2583^a; 2604^a; 2646^a; and 2587^ag). Vaccine application caused a reduction in feed consumption when compared to group NC, while treatments with coccidiostat and YCW (vaccinates and not vaccinates), showed feed consumptions that were similar among themselves and higher than the groups NC and NC + coccidiosis vaccine ($P < 0.05$) (4379b; 4626c; 4012^a; 4626c; 4736c; 4717c; and 4634cg). The lowest feed conversion index corresponded to group NC + coccidiosis vaccine that was similar to the groups with coccidiostat and with YCW (600 mg/kg feed) + coccidiosis vaccine (1.81b; 1.78ab; 1.70^a; 1.81b; 1.81b; 1.78ab; and 1.81b g/g). Results showed that YCW added to chicken feed, with or without vaccine against coccidiosis, may have effects on the productive parameters, similar to those obtained with the use of coccidiostat.

Key Words: Yeast cell walls, *S. cerevisiae*, Coccidiosis vaccine, Broilers, Coccidiostat

M86 Coccidiosis control with hyper immune, egg yolk immunoglobulins compared to a traditional coccidiostat program, nicarbazine plus salinomycine. D. Marrufo, R. Alejo, G. Parra, E. Lucio, and G. Victoria^{*}, *Investigación Aplicada S. A., Tehuacán, Puebla, Mexico.*

SUMMARY. A 100,000 broiler flock was divided in two groups in order to compare the hyper immune, egg yolk immunoglobulins anticoccidial efficacy, compared to dual program, nicarbazine plus salinomycine in-feed anticoccidial program. Powdered egg yolk immunoglobulins were administered at 200 ppm during the production cycle. The anticoccidial program consisted on 125 ppm nicarbazin (days 0-14) and 66 ppm salinomycin (SAL) (days 15-35). Group B was considered as a control.

The weight gain was used as an evaluation parameter in this experiment.

Weight gain at 35 days was greater in birds that received egg yolk immunoglobulins as compared with the nicarbazine plus salinomycine group. This difference caused a significant ($P < 0.05$) results.

The performance data, lesion scores, and oocyst counts showed that the immunoglobulins treatment was successful.

Immunoglobulins can thus be used as an alternative program instead of a dual program salinomycin and nicarbazin.

Key Words: Coccidiostat, Immunoglobulins, Coccidiosis, Eimeria, Anticoccidial drug

Tuesday, January 22, 2008 SYMPOSIA AND ORAL SESSIONS

SCAD II

T87 Identification of infectious bursal disease virus field isolates with unusual antigenicity using reverse genetics. A. Icard, H. Sellers, C. Hofacre, and E. Mundt^{*}, *University of Georgia, Athens.*

Currently, commercial and autogenous IBDV vaccines are used in the field to provide protection in poultry from humoral immunosuppression caused by circulating variant IBDVs. Recently, it has been observed that during the last third of the rearing period, chickens exhibited an increase in clinical respiratory disease. However, antibody response to vaccinations was low as measured by ELISA. This finding leads to the conclusion that viruses causing immunosuppression might play a role. To investigate the antigenicity of currently circulating IBDV field strains, the reverse genetics approach was used as a diagnostic tool. To this end, the coding region of VP2 encompassing the complete antigenic variable region of VP2 was amplified by RT-PCR and ligated into a full length

plasmid of IBDV segment A. The insert of the resulting chimeric plasmids was sequenced. The chimeric segment A was subsequently used for co-transfection experiments employing the reverse genetics approach. Antigenicity was evaluated by monoclonal antibody (mAb) reactivity patterns obtained using immunofluorescence to characterize antigenic subtypes of IBDV. 50% of the analyzed constructs resulted in a reaction pattern specific for E/Del subtype. In contrast, the remaining constructs resulted in no reactivity with any of mAbs in the panel. This indicates IBDV strains with an unknown antigenic subtype are co-circulating in the field. Interestingly, most of the nucleotide sequences of the unknown IBDV field isolates grouped with the E/Del subtype in phylogenetic analysis indicating that use of phylogenetic analysis alone would lead to an incorrect conclusion regarding the field isolate subtype. Alignment of the deduced amino acid (aa) sequence and the localization of aa in the crystal structure of VP2 of IBDV was performed. Most of the observed aa exchanges in the unknown phenotype VP2s