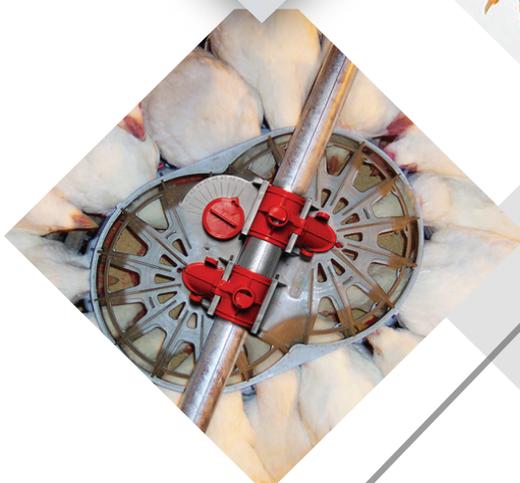




2018

INTERNATIONAL POULTRY SCIENTIFIC FORUM

JANUARY 29 – 30



ABSTRACTS
2018 International Poultry Scientific Forum
Georgia World Congress Center, Atlanta, Georgia
January 29-30, 2018

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P282 Comparison of a feed or drinking water application of butyric acid in broilers challenged with necrotic enteritis Haci Bayir*^{GS1}, Di Liu¹, Greg Mathis², Brett Lumpkins², Justin Fowler¹ ¹University of Georgia; ²southern poultry research inc.

Butyric acid has been identified as a potential feeding strategy for managing necrotic enteritis (NE) in broilers raised without antibiotics. This study was conducted to evaluate the effect of butyric acid (SmartFeedsUSA) when added in either the feed or the water on growth performance and alleviation of NE. A basal diet was formulated and fed to a challenged and a non-challenged control treatment. Two additional treatments received butyrate either in the feed or the drinking water. A total of 160 Cobb-Cobb chicks were obtained on the day of hatch and randomly distributed among treatment pens (8 birds/pen). Birds from challenged treatments were orally gavaged with ~5000 *Eimeria maxima* oocysts on day 14. On days 19, 20 and 21, the challenged birds received 10⁸ cfu/ml *Clostridium fragens*. Body weight and feed intake were recorded on day 14, 21 and 28, and mortality was recorded daily. On day 21, 3 birds per pen were randomly selected and scored for the incidence and severity of intestinal lesions. Data were analyzed using one-way ANOVA via SPSS, with significant differences ($P \leq 0.05$) separated by Duncan's Multiple Range tests. Results showed no significant differences in BW among treatments prior to the challenge on day 14. On day 21, all challenged treatments showed lower BW and higher FCR compared to the non-challenged control. For BW gain post-challenge, the water-added butyrate was higher in the challenged control, and both forms of butyrate showed improved FCR. When butyrate was added in the water, birds ended with BW and FCR comparable to the non-challenged treatment on day 28. On both day 21 and 28, in treatments with butyrate in either the feed or water, mortality was lower than the challenged control. In this study, butyrate offered benefits to growth and gut health in NE-challenged broilers over the control. However, a drinking water application showed a greater effect than when added in the feed.

Key Words: butyric acid, necrotic enteritis, broilers, gut health

P283 Use of protected sodium butyrate in broilers under antibiotic production system, a field trial Oscar Vazquez*¹, David Arteaga¹, Monica Puyalto², Cinta Sol², Juan Mallo² ¹Norel México S.A. DE C.V.; ²rel S.A

The current need to produce chickens without antibiotic growth promoters (AGPs) is a major challenge for producers; organic acids have been considered a viable alternative for several years. The aim of this trial was to compare the effect of protected sodium butyrate (Gustor N'RGY) and AGPs on productive parameters in broilers, under field conditions. Ten thousand one-day-old male broilers Ross were divided in two pens and randomly distributed in two treatments: Control treatment (C), a standard diet with AGP combination (Bacitracin Methylene Disalicylate, Colistin, quinol) and experimental treatment (PSB), the same standard diet without AGP and protected sodium butyrate (Gustor N'RGY) added at 0.5 g/t. Live body weight (BW), feed intake (FI), feed conversion ratio (FCR), flock uniformity (FU) and mortality were recorded at the end of the trial. The BW was 21 g higher at the end of the trial for PSB (2.955 kg vs 2.976 kg), while feed intake was not different (5.44 kg), and as a result FCR was 0.6% lower in PSB (1.84 vs 1.83). The FU was not different between treatments (9.25%), although the mortality was 1.2% lower in C (5.5 vs 6.7%). Finally, the productivity index was similar between treatments (320 vs 325). It can be concluded that under the conditions of this trial the use of protected sodium butyrate in broiler diets allows to get similar productive performance than AGPs.

Key Words: sodium, butyrate, antibiotic, growth, promoters

P284 Cecal digesta microbial activity in broiler chickens fed corn-soybean meal diets without or with yeast nucleotides upon challenge with *Eimeria* Haley Leung*¹, Alexander Yitbarek¹, Rob Patterson², John Barta¹, Elijah Kiarie¹ ¹University of Guelph; ²Canadian Biosystems

There is limited data on yeast nucleotides (YN) effects on poultry cecal microbial activity in the context of enteric disease challenge. 360 d old male broiler chicks (Ross 708) were used to evaluate effects of YN on cecal digesta short chain fatty acids (SCFA) concentration and microbial communities upon *Eimeria* challenge. Birds were housed in floor pens and provided a corn-soybean meal based diet without or with YN (500 g/t) (n=12). On d 10, birds in six pens/ diet were orally given 1-mL of *Eimeria* culture (*E. acervulina* and *E. maxima* sporulated oocysts) and the rest given 1-mL of distilled water. On d 15, five birds/pen were euthanized for cecal digesta. Genomic DNA was extracted, and the V3-V4 regions of the 16S rRNA gene was sequenced using the Illumina Miseq® platform, and sequences were curated using Mothur as described in the MiSeq SOP. An interaction ($P = 0.04$) was observed for cecal pH such that YN increased pH in challenged birds (6.21 vs. 6.85) only. There was an interaction between YN and *Eimeria* on citric acid ($P = 0.001$), propionic acid ($P = 0.001$) and total SCFA ($P = 0.006$) such that YN increased total SCFA in the absence of *Eimeria* and decreased SCFA in the presence of *Eimeria*. There was no interaction ($P > 0.10$) between YN and *Eimeria* on the cecal digesta microbial community. Feeding YN tended ($P = 0.07$) to decrease microbial community alpha diversity. *Eimeria* challenge tended ($P < 0.06$) to decrease abundance of phylum *Firmicutes* (83.8 vs. 88.7%) and reduced ($P < 0.05$) genus *Clostridium XIVa* (5.4 vs. 9.9%) and *Oscillibacter* (1.1 vs. 1.7%). Relative to birds not fed YN, YN fed birds had greater abundance of the genus *Anaerostipes* (1.2 vs. 0.3%; $P = 0.01$) and tendency for greater abundance for genus *Oscillibacter* (1.7 vs. 1.1%; $P = 0.06$). YN fed birds had a tendency for lower abundance of *Clostridium XIVa* (6.1 vs. 9.6%; $P = 0.10$) relative to birds not fed YN. In summary, effects of YN and *Eimeria* were interactive on fermentation metabolites but independent of the microbial community. *Eimeria* tended to reduce *Firmicutes*, which accounts for >85% of the gut bacteria population whereas YN tended to reduce microbial diversity commensurate to antimicrobials. *Eimeria* and YN reduced abundance of genus *Clostridium XIVa* linked to butyrate production.

Key Words: *Eimeria*, nucleotide, cecal, microbial, activity

P285 Extended heat treatment of a broiler starter diet containing formaldehyde does not impact the overall amino acid digestibility or TMEn content of the diet Matthew Jones*¹, Kurt Richardson², Charles Starkey³, Nick Dale¹, Adam Davis¹ ¹University of Georgia; ²Anitox Corporation; ³Auburn University

Pathogens can infiltrate food animal production systems at several points including through the diet the animals are fed. Dietary introduction of pathogens is also a serious issue because the animal production units all serviced by the same feed mill can be affected. In broiler production, the elimination of pathogens such as *Salmonella* that can cause food borne illness in humans remains a major goal. *Salmonella* contamination of diets can be mitigated by chemical measures such as the addition of formaldehyde and/or prolonged heat treatment during production. However, there is concern that such treatments can reduce the nutrient availability of the treated diet. Therefore, the goal of the present research was to determine if the application of a specific formaldehyde feed additive, Termin-8, in combination with extended heat treatment, reduces the TMEn and available amino acid content of a broiler starter diet. Cecectomized and intact adult Single Comb White Leghorn roosters were used to determine amino acid digestibility and TMEn, respectively, of a broiler starter diet treated with 0 or 0.3% formaldehyde solution prior to heat treatment at 82°C for 4.5 minutes. The digestibility coefficients of the amino acids of the diets were equal except for arginine. The arginine digestibility coefficient in the control diet was 94.17% and this was reduced ($P < 0.05$) to 93.39% in the formaldehyde containing diet. The addition of formaldehyde did