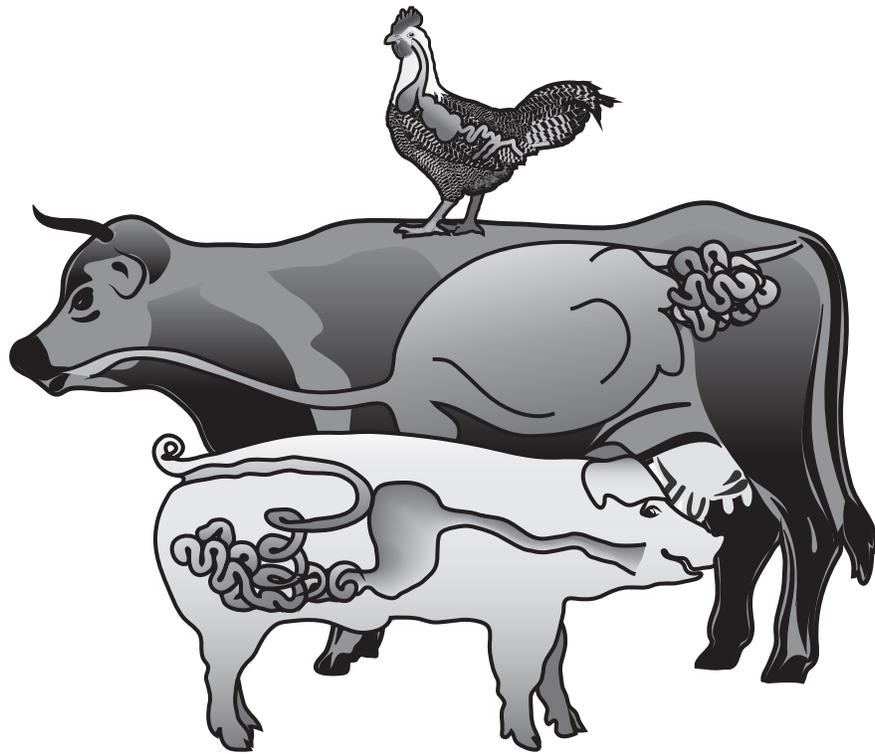


# **Symposium on Gut Health in Production of Food Animals**

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# **Program and Abstracts**

**[www.GutHealthSymposium.com/2016](http://www.GutHealthSymposium.com/2016)**



- P125      Effect of two sources of sodium butyrate on performance and gut morphology of post-weaned piglets.  
*C. Sol\**, *N. Hillis*, *M. Puyalto*, *P. Honrubia*, and *J. J. Mallo*, NOREL SA, Madrid, Spain.
- P126      Replacing enramycin by a probiotic, *Bacillus subtilis* PB 6, as a natural growth promoting agent in commercial broiler chickens (*Gallus gallus domesticus*).  
*C. P. Soon\** and *T. Nguyen*, Kemin Industries (Asia) Pte Ltd, Singapore.
- P127      Enterocyte protein tyrosine nitration in response to *Eimeria* infection in broilers.  
*T. Elsasser\**<sup>1</sup>, *K. Miska*<sup>1</sup>, *S. Kahl*<sup>1</sup>, *R. Fetterer*<sup>1</sup>, and *A. Martinez*<sup>2</sup>, <sup>1</sup>USDA-ARS, Beltsville, MD, <sup>2</sup>Center for Biomedical Research of La Rioja (CIBIR), La Rioja, Spain.



(body weight, 650 kg) were used in a  $5 \times 5$  Latin square. Heifers were fed ad libitum diet containing 10% barley silage and 90% barley concentrate (DM basis). Five treatments were: 1) control (CON; no additives); 2) antibiotics (ANT; 28 mg/kg monensin + 11 mg tylosin/kg diet DM); 3) 4 g/head/d LY as-is, LY; 4) 4 g encapsulated LY (EY); and 5) 4 g of each LY and EY (MY). Yb and 15N were labeled, respectively, digesta and rumen microbes. Omasal sampling technique was used to measure the flows out of the rumen. Intake of DM (kg/d) ranged from 11.3 to 12.1 and was not affected by treatment. Flows (kg/d) of OM to omasum tended ( $P < 0.08$ ) to be lower for heifers fed MY (4.5) than for CON (5.2) and ANT (5.3). Ruminant OM digestibility was greater ( $P < 0.02$ ) with LY (71%) or MY (72%) than with CON (67%) and ANT (66%). However, intestinal digestibility (% of intake) of OM was not affected by treatments. As a result, the total digestibility of OM tended ( $P < 0.07$ ) to be higher with LY (80) and MY (81) than with CON (78) and ANT (77%). Microbial N production (averaged 140 g/d) was not affected, whereas microbial efficiency was lower ( $P < 0.02$ ) for MY versus CON (15 vs. 22 g/kg rumen fermented OM). These results indicate that supplementation of high-grain diet with LY slightly improved rumen OM digestion, thus in the total digestive tract, which suggest that improvement of postruminal digestion by adding protected LY is not apparent.

**Key words:** beef heifer, digestibility, live yeast

#### **P124 Effect of yeast extract rich in nucleotides on gut health and performance of broiler chickens.**

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The GIT of the chicken grows more rapidly than the rest of the body in the first few days post hatching undergoing a rapid morphological, molecular and biochemical changes. Human and animal studies have shown that dietary nucleotides play a major role in the growth and maturation of tissues with higher turnover of cells such as the intestine and the immune system. Nucleotides are not essential nutrients as they can be synthesized de novo by the animal, but exogenous supply in the form of feed additives may improve gut health and hence performance of animals. Therefore, the objective of this study is to investigate the effect of 2 different concentration levels of yeast extract rich in nucleotides (500 g/ton vs 750 g/ton) supplemented under 2 different feeding programs (d 0 to d 21 vs d 0 to d 35 of age) on the performance and gut health of broiler chickens. A total of 95 male Ross 308 birds were randomly allocated into 5 different treatment groups with 19 birds per treatment. Zootechnical parameters were measured at different time points during the study and finally 5 birds per group were sacrificed at d 21 and d 35 of age to collect tissue samples for morphometric studies in the duodenum, jejunum and ileum. All birds which received yeast extract supplement were heavier than the control birds at the end of the experiment with higher ADG; however, the effect was significant ( $P < 0.001$ ) both for final weight and ADG only in birds supplemented with 500 g/ton yeast extract in both feeding programs. Birds which receive 500g/ton yeast extract rich in nucleotides also show a significantly better ( $P < 0.0001$ ) feed conversion ratio. Supplementation for only 21 d significantly increased ( $P < 0.001$ ) villi height and width, while decreasing the crypt depth in the duodenum. From these

results we can conclude that supplementation of birds with 500g/ton yeast extract rich in nucleotides for about 21 d may improve performance of birds by increasing absorptive surface area and enhancing barrier function in the intestine.

**Key words:** broiler chicken, gut health, nucleotides

#### **P125 Effect of two sources of sodium butyrate on performance and gut morphology of post-weaned piglets.**

C. Sol\*<sup>1</sup>, N. Hillis, M. Puyalto, P. Honrubia, and J. J. Mallo, NOREL SA, Madrid, Spain.

The present study evaluated the effect of GUSTOR N'RGY (70% of sodium butyrate protected with 30% of sodium salts of palm fatty acids distillates) and BUT (54% sodium butyrate protected with phosphate salts) on performance and gut morphology in piglets. A total of 72 piglets weaned at 21 d old ( $6.7 \pm 0.13$  Kg) were randomly divided into 3 groups with 6 replicates each (4 animals per replica): (CON) basal diet without additives; (N'RGY) basal diet with GUSTOR N'RGY (3kg/t in pre-starter phase and 1 kg/t in starter phase); and (BUT) basal diet with BUT (3.9kg/t in pre-starter phase and 1.3 kg/t in starter phase), achieving the same quantity of sodium butyrate in both treatments. Mash feed and water were offered *ad libitum*. The trial lasted 28 d, at the end BW, ADG, ADFI and FCR were recorded, and one piglet per replica was euthanized and samples from duodenum, jejunum and ileum were analyzed to evaluate gut development. Data were analyzed by one-way ANOVA using GLM procedure of SAS. Results of performance parameters were analyzed using initial BW as a covariable. There were no differences in performance parameters. Although piglets fed diets in N'RGY group achieved a higher final BW ( $P > 0.05$ ). Piglets in BUT group were the lightest, with 850 g less than N'RGY group. The highest BW achieved by N'RGY group and the low ADFI, resulted in a better FCR at the end of the trial ( $P > 0.05$ ). The reduction in FCR of N'RGY group accounted for a 12% compared with CON group and 19.4% respect to BUT group. At d 49, there were no differences in duodenum. In jejunum, crypt depth tended to be lower in BUT (314.2, 301.6 and 272.3  $\mu$ m, for CON, N'RGY and BUT treatments;  $P = 0.089$ ). In ileum, villus height tended to be higher in N'RGY group (307.6, 385.9 and 320.1  $\mu$ m, for CON, N'RGY and BUT;  $P = 0.095$ ) and the ratio of villus: crypts was higher in N'RGY group compared with CON group (1.18, 1.64 and 1.29, for CON, N'RGY and BUT;  $P = 0.031$ ). It can be concluded that the protection of sodium butyrate with sodium salts of palm fatty acids (GUSTOR N'RGY) is more efficient than the protection with phosphates salts and for this reason in piglets fed with GUSTOR N'RGY more quantity of active ingredient can reach small intestine to increase absorption surface.

**Key words:** sodium butyrate, gut morphology, piglets

#### **P126 Replacing enramycin by a probiotic, *Bacillus subtilis* PB 6, as a natural growth promoting agent in commercial broiler chickens (*Gallus gallus domesticus*).**

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The use of beneficial microbes, or probiotics, as alternatives to antibiotics as growth promoter in poultry feed to prevent