

S-P212 Effect of two commercial competitive exclusion probiotics on *Salmonella enterica* serovar *enteritidis* infection of Leghorn chicks. M.A. Juarez-Estrada*, L. Gonzalez-Soto, and R. Merino-Guzman, *Department of Animal Production: Poultry; FMVZ-UNAM., Mexico, D.F. Mexico.*

A trial was developed in order to evaluate one defined competitive exclusion probiotic (DCEP) and one non-defined competitive exclusion probiotic (NDCEP) on *Salmonella enterica* serovar *enteritidis* phagotype 13^a (SE PT13^a) infection. One-day-old Leghorn chicks were reared in electrical batteries. Four groups and 6 replicates of 20 birds each one (n=240) were used in two challenge times. Experimental groups were: A) Negative control, B) DCEP (Broilact[®]) 1 mg at first day, C) NDCEP (Aviguard[®]) 12.5 mg at first day, D) Positive Control. Groups B, C and D were SE PT13^a (1X10⁸) UFC/bird challenged at 11 and 19 days. On 12 and 20 days, 60 birds from every challenged groups were euthanized. SE PT13^a was recovered from liver-spleen (LS), and cecal tonsils (CT) from each chick. At 20 days, group B showed up 21.7% of SE PT13^a from LS, lower (P<0.05) than group D (51.7%). Group C (36.7%) was not different to B or D treatments. There were no differences in recovery rates from CT at either, 12 or 20 days. Group A was always negative to *Salmonella* isolation. Although, there was not difference in LS protection level between DCEP or NDCEP groups, DCEP showed up a more solid protection. Intestinal native microbiota from DCEP took almost three weeks in settling down into the chickens gun, thus, its protection effects were delayed, since they were observed until 20 day of age. In order to get an effective protection level from DCEP against early *Salmonella* infection, it should be tested the effect of a booster DCEP treatment in chicks from one to twenty days old.

Key Words: probiotics, *Salmonella* control, Leghorn chicks, layer farm, fertile eggs

S-P213 Effect of a booster treatment with a defined competitive exclusion product on *Salmonella enterica* serovar *enteritidis* infection in Leghorn chicks. M.A. Juarez-Estrada* and J.A. Molina-Hernandez, *Department of Animal Production: Poultry; FMVZ-UNAM., México, D.F. México.*

In order to evaluate a defined competitive exclusion product (DCEP) with only one *per os* treatment at one-day-old or a drinking water booster treatment, was carried out one experiment. At first was divided into three groups with 28 birds each and three replicates by group. Group A) At first day DCEP (1 mg/bird Broilact[®]) was gave *per os*, 28 birds were challenged with *Salmonella enterica* serovar *enteritidis* fagotype 13^A (SE PT13^A) (1 x 10⁸ CFU/bird) each time at 7, 13 and 23 days of age; B) At first day chicks received DCEP, it was boosted by drinking water (1 mg/bird Broilact[®]) at 6, 12 and 22 days of age, 24 hours after every booster treatment 28 birds were challenged with SE PT13^A; C) At first day of age birds received PBS, they were challenged *per os* with SE PT13^A at the same time like groups A and B. All birds were euthanized 24 hours after every challenge. SE PT13^A was recovered from liver, spleen (LS) and cecal tonsils (CT). At 14 days of age SE PT13^A; isolates from group B (LS 4.5% and CT 22.7%) were lower (P<0.05) than group C (LS 34.6% and CT 96.1%); and group A (LS 17.2% and CT 62.0%) respectively. With only 28 birds by treatment, group A was not different to B or C treatments. At 8 and 24 days there were not differences between groups. The booster treatment was better than only one DCEP dose, however, booster treatment with DCEP delayed to diminish SE PT13^A; infection from LS and CT, until the last of the second week. Prophylactic treatment with defined competitive exclusion products would be a good biological skill toward *Salmonella* infection in Layer farms.

Key Words: probiotics, booster treatment, *Salmonella* control, breeder hens, Leghorn chicks

**Tuesday, January 24
Keynote Speaker
SCAD Keynote Address
Room: B313.**

Resurgence of runting stunting syndrome in broiler chickens.
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Runting and stunting syndrome is a condition involving significant body weight depression and low flock uniformity detectable at an early age, but the detrimental effects are observable throughout the entire broiler growout. As a syndrome, the clinical presentation of this condition may vary substantially from flock to flock, but runting and stunting syndrome (RSS) is invariably associated with poor economic performance derived at least from slow growth, low uniformity, increased mortality or culling of unthrifty chickens and increased feed conversion. RSS was first described in the 1970s and since then most research has attempted to resolve potential pathogens. Broiler flocks of all breeds or breed crosses may be affected, albeit certain crosses are more frequently and/

or more severely affected. Progeny from younger breeder flocks tends to be affected by RSS easier than progeny from hens over 45 weeks of age.

Some of the agents found in RSS-affected flocks include reovirus, enterovirus-like particles, adenovirus, astrovirus, rotavirus and other small round enteric viruses. Bacterial species have also been examined for their potential ability to induce RSS, but none have been regarded as important candidates. Direct inoculations in chickens with any of these agents alone or in combination have not reproduced entirely all the detrimental effects observed with RSS in the field. However, two models have consistently reproduced severe stunting. First, gavage inoculations of intestinal homogenates from affected birds into susceptible chickens usually induce body weight depression equivalent to more

than 50-60% in comparison with control uninoculated chickens. Second, exposure of newly hatched chicks to RSS agents by rearing them on contaminated litter material reliably induces body weight depression equivalent to approximately 40-50% compared to control chickens reared on clean litter. Two major avenues of research have been followed in recent months to address significant field problems observed between the winter of 2003 and 2005: 1) A number of viruses have been isolated from the intestines of affected chickens. Amongst such viruses, reoviruses and astroviruses are of higher interest. Partial characterization of reoviruses has suggested that some of the reoviruses circulating in the field might be substantially different from standard reoviruses used in commercial vaccines. Some of these reoviruses are being explored as potential candidate strains for killed vaccines. Investigations on astroviruses are ongoing but no conclusions can be made at this point.

Regarding intervention strategies, it has been shown recently that raising broilers on contaminated litter with a very short downtime is substantially detrimental to body weight gain, uniformity and it also reproduces microscopic enteric lesions commonly observed in field cases of RSS. Also, along the lines of intervention strategies, recent research

involving heat treatment of infectious intestinal material has demonstrated that RSS agents are indeed heat sensitive. Thus, current investigations are addressing this characteristic in order to develop methodology with a field application to mitigate the detrimental effects of RSS agents in the field by applying heat to chickens houses during downtime.

An additional field of research involves the possibility of maternal transfer of protective antibodies. In a current trial grandparent breeder hens are being exposed to the same infectious material that causes severe weight depression in young broilers with the intention of producing progeny to be exposed to contaminated litter. Finally, a variety of studies are being conducted to examine any possible correlation between RSS and maternal antibody titers to agents such as reovirus, chicken infectious anemia virus, infectious bursal disease and others. In summary, most current research is emphasizing virus characterization both in vivo and in vitro, maternal immunity, and studies designed to reproduce RSS reliably and to develop methodologies to mitigate the economic impact of RSS in broilers.