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( $P < 0.05$ ). The birds of the T2 presented lower number of positive birds and presented lower SH count in relation to the control group T1. As a conclusion: the use of Poulvac ST (T2) vaccine was shown to be efficient in reducing SH swab samples and organs at the ages evaluated. In relation to SH count in cecum: under the conditions evaluated in this experiment the use of the Poulvac vaccine ST (T2) has been shown to be an efficient treatment for reducing SH count in cecum samples 35 d of age. Cross-immunity between ST and SH has been demonstrated.

**Key Words:** aroA genetically modified vaccine, cross-protection, *Salmonella* Heidelberg, vaccination, food-borne disease

**135 Evaluation of protective long-term immunity and passive immunity transfer by an orally administrated subunit vaccine against *Salmonella* spp. in poultry.** E. R. Gumina\*<sup>1</sup>, E. Moreira<sup>1</sup>, G. Almaraz<sup>1</sup>, A. Sujezky<sup>1</sup>, and S. Layton<sup>2</sup>, <sup>1</sup>Vetanco S.A, Buenos Aires, Argentina, <sup>2</sup>Vetanco International/BV Science, Vicente Lopez, Buenos Aires, Argentina.

The objective of this study was to determine the efficacy of an inactivated subunit vaccine administered orally, Biotech Vac Salmonella, by evaluating the protection and persistence of the induced humoral immune response in 2 lots of layers, as well as evaluating the transfer of passive immunity through the yolk sac during the hatching period of one breeder flock. Long-term protection and immunity was evaluated in 2 lots of commercial layer hens (HyLine,  $n = 120,000$  layers/lot) located in Buenos Aires, Argentina. Biotech Vac Salmonella (BVS), Vetanco SA was administered in lot 1 at d3, 16 and 91 and in lot 2 at d3, 16 and 84. Mucosal scrapings and serum were collected in lot 1 at 6, 21, 33, 67 and 89 weeks of life, and in lot 2 at 5, 13, 22, 56 and 78 weeks of life to determine sIgA and IgY respectively ( $n = 15$  paired samples/sampling point). To evaluate passive immunity transfer, a commercial breeder farm located in the province of Entre Rios, Argentina (Cobb  $n = 240,000$  breeders) was vaccinated on d3, 17 and 119 with BVS, 46 weeks after vaccination, yolk sac from 10 PIPs were collected at the hatchery to determine BVS specific IgY and IgA. The humoral immune response in the mucosae (sIgA) and circulating (IgY) induced by vaccination with Biotech Vac Salmonella was evaluated by means of a proprietary ELISA developed specifically for the Biotech Vac Platform. Absorbances obtained by ELISA were transformed and the data expressed as S/P ratios. Data were analyzed using Student's 2-tailed *t*-test assuming unequal variances to compare the difference between groups using Prism statistic software. A value of  $P < 0.05$  was considered significant. Results indicate that at all sampling times after administration of Biotech Vac Salmonella there was a significant increase ( $P < 0.05$ ) of sIgA and IgY in layers. Birds immunized with Biotech Vac Salmonella showed protective sIgA values (S / P ratio  $\geq 2.0$ ) throughout the evaluation period. Additionally, the presence of vaccine specific IgY antibodies was observed throughout the evaluation period. Moreover, no correlation was observed between mucosal

sIgA and circulating IgY/IgG either in terms of protection or quantity of vaccine specific antibodies produced. The increased presence of Biotech Vac Salmonella specific IgA and IgY in the yolk sac from PIPs, indicates that there is a vertical transfer of maternal antibodies to the progeny after immunization of the breeders.

**Key Words:** immunity, vaccine, *Salmonella*, poultry, immunoglobulin

**136 Chronic heat stress and *Salmonella enteritidis* challenge in Japanese quail: Immune effects in adult and transgenerational consequences.** O. Giayetto, E. A. Videla, M. C. Labaque\*, R. H. Marin, and F. N. Nazar, Instituto de Investigaciones Biológicas y Tecnológicas (IIByT; CONICET-UNC) and Instituto de Ciencia y Tecnología de los Alimentos (ICTA), Facultad de Ciencias Exactas, Físicas y Naturales, Universidad Nacional de Córdoba, Córdoba, Argentina.

Stressful events during production such as routine vaccination protocols and high environmental temperatures are common challenges for poultry species. Chicks' prenatal environment can be influenced by these events, inducing trans-generational effects. This study evaluated whether an immune challenge and a chronic heat stress (CHS) exposure on adult Japanese quail can modulate later immune responses and whether those effects can be reflected in their offspring. Eighty adults were inoculated with inactivated *Salmonella enteritidis* (challenge initiated at 115 d of age) and then exposed to a CHS along 9 d (between 121 to 129 d of age) by increasing the environmental temperatures from 25 to 34°C during the daylight hours. A 2 × 2 factorial experimental design was used and 4 treatment groups (20 birds each) were therefore defined: Non Challenged-Non Stressed, Challenged-Non Stressed, Non Challenged-Stressed and Challenged-Stressed. Between 125 and 130 d of age, eggs were collected and incubated. Newly hatched chicks ( $n = 82$ ) were identified according to their parental treatments. Percentage of inflammation, Heterophil/Lymphocyte (H/L) ratio and antibody titers against sheep red blood cells (SRBC) were evaluated both in adults and their offspring. In adults, compared with controls, stressed groups showed a reduced percentage of inflammation ( $P < 0.001$ ) and an elevated H/L ( $P = 0.02$ ), regardless of the challenge. No differences between groups were found in SRBC titers. In offspring, the percentage of inflammation was elevated ( $P = 0.03$ ) and the SRBC titers were reduced ( $P = 0.02$ ) in chicks whose parents were stressed, independently of the challenge. The H/L ratio of the chicks did not differ between groups. The immune challenge had no impact on the selected variables either on the adult quails or in their offspring, suggesting that all groups (stressed or not) were capable of dealing with the vaccine challenge. On the other hand, the CHS affected the immune response both in the adults and in their offspring which could have important welfare and productive implications.

**Key Words:** poultry, immunity, stress, offspring, parental