



EFFECT OF ESSENTIAL OILS, FATTY ACID AND MINERAL BLEND PRODUCT ON A LIVE SALMONELLA VACCINE IN A *SALMONELLA INFANTIS* CHALLENGE MODEL

Charles L. Hofacre¹, Matthew K. Jones¹, Jennie A. Baxter¹, Aldo Rossi², Jay Hughes², and Roy D. Berghaus³

¹Southern Poultry Research Group, Watkinsville, Georgia

²Oil-Dri Corporation, Chicago, Illinois

³Department of Population Health, College of Veterinary Medicine, The University of Georgia, Athens, Georgia

ABSTRACT

Salmonella infantis has become a more prevalent serovar isolated by poultry processing plants and has also been linked to foodborne illness cases by CDC. The live *Salmonella* vaccines are slightly less effective against serogroup C salmonella such as *S.I.* Therefore, combining a live vaccine with other interventions may be an effective strategy to control *S.I.* In this pilot study, there were three treatments: No treatment; Live vaccine alone (MeganVac1TM); Live vaccine with a product that is a blend of essential oils, medium chain FA and a mineral blend (NeutraPath[®]). The live vaccine was sprayed at one dose per bird at 1 day of age. The study had 300 Aviagen male broilers in six pens (50 birds/pen) with two replicate pens/treatment. Vaccine re-isolation was 4 birds per pen on day 3 of the study. On day 7, all birds were orally gavaged with 5.0×10^7 CFU/chick *S.I.* Fifteen cloaca swabs per pen were tested on day 15. Then on day 42, 15 ceca were sampled per pen. *Salmonella* was cultured with tetrathionate/XLT-4; enumeration by micro MPN. *Salmonella* prevalences were compared between treatments using GEE logistic regression and *Salmonella* MPN's were compared using linear mixed models. For vaccine re-isolation, there were 100%^a positive in the live vaccine alone and 88%^a vaccine re-isolation in the live vaccine plus NeutraPath[®].

Results of the *S.I.* prevalence in cloaca swabs: challenge control 77%^b, vaccine only 57%^{ab} and vaccine plus essential oil/FA/mineral blend 20%^a. Cloaca swab MPN estimated means were 0.57^a log₁₀ MPN/swab for control, 0.88^a for live vaccine only and 0.31^a for vaccine plus essential oil/FA/mineral blend. Ceca prevalence on day 42 were 67%^b for challenge control, 0%^a for live vaccine, and 43%^b for live vaccine plus NeutraPath[®]. Ceca MPN results were 0.74^a log₁₀ MPN/g for control, N.A. for live vaccine alone, and 0.09^a log₁₀ MPN/g live vaccine plus NeutraPath[®]. Overall, there were many more individual ceca at less than 1 log of *S.I.* in the combined treatment than the challenge control. There was a significant reduction in cloaca swab *S.I.* prevalence with the combined live vaccine and NeutraPath[®]. There was not a significant effect of the essential oil/FA/mineral blend product on the live *Salmonella* vaccines ability to colonize broilers.

Keywords: *Salmonella infantis*, live vaccine, essential oil, fatty acid

