

TITLE: EFFECT OF ORGANIC ACID BLEND AND PROBIOTIC ALONE OR IN COMBINATION IN CONTROL *Salmonella* Enteritidis IN BROILER CHICKENS.

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ABSTRACT:

Salmonella spp. is capable of infecting humans and animals orally, through water or contaminated food. A wide variety of food products, especially poultry meat and eggs, are the main sources of *Salmonella* infection in humans. In this context, several measures of prevention and control of the pathogen have been proposed and studied, with emphasis on the use of probiotic microorganisms and organic acid. The objective of this study was to evaluate the action of organic acid blend (calcium formate, calcium propionate, potassium sorbate and fumaric acid) and *pool Lactobacillus* spp. (PL) in the control of *Salmonella* Enteritidis (SE) in broiler chickens. The broilers (72) were housed at one day of life and divided in the following treatments: T1- challenged birds with SE; T2- treatment with organic acid Blend (1.5 g.kg⁻¹) and challenged with SE; T3 - treatment with PL (10⁹ CFU/mL) in the first three days of life and challenged with SE; T4- treatment with PL and organic acid blend (1.5 g kg⁻¹) and challenged with SE. At 14 days of age, the animals received SE gavage (1.2 x 10⁵ CFU / mL). After one, seven and 14 days of inoculation, six animals from each treatment were sacrificed for bacterial recovery in cecum. The data were submitted to analysis of variance followed by comparison of means with Scott-Knott's test, at 5% significance level. The T3 and T4 treatments showed the lowest bacterial recovery one day after the challenge (2.97 and 3.10 Log₁₀ CFU /mL respectively) differing significantly (p> 0.05) from T1 (4.43) and T2 (4.46). However, after 7 and 14 days from the challenge, it was observed that the lowest bacterial recovery rate were noticed in T4 (1.25 and 1.7 Log₁₀ CFU/mL respectively), differing significantly from the other treatments. The mean values from T2 (4.9 and 4.1 Log₁₀ CFU / mL) and T3 (5.5 and 3.4 Log₁₀ CFU/mL) at 7 and 14 days post challenge did not differ significantly from each other, however they differed from the positive control -T1 (5.5 and 5.2 Log₁₀ CFU / mL). Both the organic acid blend and PL were able to reduce intestinal colonization by SE. However, the action of *pool Lactobacillus* combined with the organic acid blend was synergic and promoted the lowest intestinal colonization by SE. It is concluded that the supply of PL in the early stages of broiler life, as well as dietary supplementation with organic acids, or even the combination of the two treatments are effective in controlling SE infection in broiler chickens.

Keywords: Gut health; antimicrobial alternative, *Salmonella* spp.