



Study on effect of antibiotic, probiotic and/or organic acids on experimental infection with *Salmonella enteritidis* field isolate in broiler chicken

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Abstract : *Salmonella enteritidis*(*S.enteritidis*) was isolated, biochemically tested serotyping and PCR from field infected clinically diseased broiler chicken. An experimental study was fulfilled in order to compare current efficiency of antibiotic colistin sulphate, *B.subtilis* and acidifiers mixtures on control of field isolate *S. Enteritidis* in broiler chickens. A total number of 290 Cobb broiler chicks were used, 1- day old, ten examined bacteriologically to prove their freedom from *S. Enteritidis*, 280 chicks were divided into 7 equal groups, 40 chicks in each. Groups 1, 2 and 3 received organic acids start from five days of age till two weeks post challenge, groups 1 and 4 treated with colistin sulphate start from 2nd day post challenge for 5 successive days while groups 2 and 5 treated with *B. subtilis* from 5 days of age till two weeks post challenge while group 6 and 7 kept as control negative non treated group and positive challenged group respectively. All birds groups except control negative group 6 were challenged orally by 0.5 ml containing 10⁹ CFU/ml *S. Enteritidis* at 21 days of age. Clinical diagnosis, performances together with histopathological examination of liver and spleen were studied. Results of mortality rate revealed that the highest mortality rate was group 7 (control positive group) which was 35%, followed by group 3 (organic acid group) which was 17.5%, then group 5 (*B.subtilis*) which was 15%, followed by group 2 (*Bacillus subtilis* – organic acid groups) which was 12.5%, followed by group 4 (colistin) which was 10%, then group 1 (colistin – organic acid) which was 5%, and finally group 6 (control negative) showing no mortalities. Samples from dead birds including liver, heart, spleen and cecum were aseptically collected from each group post challenge for *S. Enteritidis* re-isolation. Which indicate positive for *S.entertidis* microorganism which considered suspected cause for mortalities. Concerning ABW it was found that the lowest is group 7 (infected control positive) which was 1831 gm by the end of the experiment when compared with control negative group 6 which was 2050 gm. On the other hand the highest ABW by the end of the experiment was group 2 (received organic acids and *Bacillus subtilis* which was 2160 gm followed by group 1 (colistin sulphate and organic acids) which was 2130 gm, then followed by group 4 (colistin only) which was 2110 gm, followed by group 5 (*B. subtilis*) which was 2100 gm, then followed by group 3 (organic acids) which was 2095 gm. FCR group 7 (infected non treated) was the highest (bad FCR) which was 1.75, followed by group 4 (colistin sulphate) which was 1.62, then followed by control negative group 6 (1.61), followed by group 3 (organic acid) and 5 (*B. subtilis*) which both have the same results which was 1.60, followed by group 1 (colistin and organic acid) which was 1.59 and finally the best feed conversion rate was group 2 (organic acids and *B. subtilis*) which was 1.58. Histopathological changes it was found that liver and spleen of control negative group 6 show normal histology while group 7 (infected) liver showed congestion of the sinusoids, area of

coagulative necrosis infiltrated with lymphocytes and the hepatocytes suffering from hydropic degeneration in the cytoplasm, other histopathological sections showed showing congestion of the sinusoids, area of coagulative necrosis infiltrated with lymphocytes with fatty changes. Spleen of gr 7, there was severe congestion of the red bulb and area of hemorrhages, later severe depletion of the lymphoid follicle takes place, on the other hand groups 1 (colistine + organic acid), 2 (organic acid + *B.subtilis*) and gr 4 (colistine) show mild pathological changes in liver. groups 3 (organic acid) and 5 (*B.subtilis*) showing moderate changes in liver. It could be concluded that *S enteritidis* has great economic importance in poultry industry and could be controlled with new antibiotic alternative such as organic acids and prebiotics preventing hazard and improve poultry performance.

Key words : broiler performance, prebiotic, *Salmonella enteritidis*, colistine, Bacillus subtilis , organic acid, PCR.

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