Potency of Some Dietary Acidifiers on Productive Performance and Controlling Salmonella enteritidis in Broilers

Authors : Mohamed M. Zaki, Maha M. Hady

Abstract : Salmonella spp. have been categorized as the world's biggest threats to human health and poultry products are mostly incriminated sources. In Egypt, it was found that S. enteritidis and S. typhimurium are the most prevalent ones in poultry farms. It is recommended to eliminate salmonella from living bird by competing for salmonella contamination in feed in order to establish a healthy gut. The Feed acidifiers are the group of feed additives containing low-molecular-weight organic acids and/ or their salts which act as performance promoters by lowering the pH in the gut, optimizes digestion and inhibit bacterial growth. The inclusion of organic acid in pure form nonetheless effective in feed, yet, it is difficult to handle in feed mills as it is corrosive and produce more losses during pelleting process. The current study aimed at to evaluate the impact of incorporation of sodium diformate (SDF) and a commercial acidifier, CA (a mixture of butyric and propionic acids and their ammonium salts) at 0.4% dietary levels on broilers performance and the control S. enteritidis infection. Two hundreds and seventy unsexed cobb chickens were allotted in one of three treatments (90/ group) which were, the control (no acidifier, C-&C+), the 0.4% SDF (SDF- & SDF +) and the 0.4% CA (CA- & CA +) dietary levels for 35 days. Before the allocation of the groups, ten extra birds and a diet sample were bacteriologically examined to ensure negative contamination with salmonella. The birds were raised on deep-litter separated pens and had free access to feed and water all the time. The experimentally formulated diets were kept at 40C. After 24h access to the different dietary treatments, all the birds in the positive groups (n=15/ replicate) were inoculated intra-crop with 0.2 ml of 24 h broth culture of S. entertidis containing 1X 107 organisms while the negative-treated groups were inoculated with the same amount of the negative broth and second inoculation was done at 22 d of age. Colocal swabs were collected individually from all birds 2 h pre-inoculation to assure the absence of salmonella, then 1, 3, 5, 7, 21 days post-inoculation to recover salmonella. Performance parameter (body weight gain and feed efficiency) were calculated. Mortalities were recorded and reisolation of the salmonella was adopted to ensure it was the inoculated ones. The results revealed that the dietary acidification with sodium diformate significantly improved broilers performance and tends to produce heavier birds as compared to the negative control and CA groups. Moreover, the dietary inclusion of both acidifiers at level of 0.4% was able to eliminate mortalities completely at the relevant inoculation time. Regarding the shedding of S. enteritidius in positive groups, the SDF treatment resulted in significant ($p<0.05$) cessation of the shedding at 3 days post-inoculation compared to 7 days post-inoculation for the CA-group. In conclusion, sodium diformate at 0.4% dietary level in broiler diets has a valuable effect not only on broilers performance but also by eliminating S. enteritidis the main source of salmonella contamination in poultry farms which is feed.

Keywords : acidifier, broilers, Salmonalla spp, sodium diformate
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