

Impact of Probiotics on Survival Rate and Growth in Salmonella-Challenged Broilers

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Abstract : Aim: This study aimed to assess the effects of *Lactobacillus paracasei* SH1 supplementation, isolated from shubat (a traditional fermented dairy product), on broiler chickens' resistance to *Salmonella typhimurium* and its impact on growth performance. Introduction: Probiotic use in poultry farming is an emerging alternative to antibiotics, addressing concerns about resistance and food safety. Probiotics can enhance gut health, support the immune system, and mitigate pathogen colonization. Fermented dairy products like shubat are known for their rich microbial diversity, making them a valuable source of probiotic strains. This study investigates how probiotics derived from shubat influence broiler health and growth when exposed to *Salmonella typhimurium*. Methods: The study involved 80 broiler chickens divided into four groups (20 chickens per group), monitored over a 42-day period. Each group underwent different treatments to evaluate the effects of *Lactobacillus paracasei* SH1 supplementation and *Salmonella typhimurium* exposure: Group 1: Control group. This group did not receive *L. paracasei* SH1 supplementation or *S. typhimurium* exposure, serving as the baseline for comparison. Group 2: Probiotics + *Salmonella* group. Chickens in this group were supplemented with *L. paracasei* SH1 at a dose of 1×10^8 CFU/day for 42 days. On the 21th day, they were exposed to *S. typhimurium* (1×10^7 CFU) to evaluate the combined effects of probiotics and a pathogen challenge. Group 3: Probiotics-only group. This group received probiotic supplementation (*L. paracasei* SH1, 1×10^8 CFU/day) for the entire 42-day period but was not exposed to *S. typhimurium*. Group 4: *Salmonella* group. Chickens in this group were exposed to *S. typhimurium* (1×10^7 CFU) on the 21st day without any probiotic supplementation. Results: Average body weights also differed across the groups; however, the differences were not statistically significant ($p > 0.05$). Group 3 (Probiotics-only group) achieved the highest average weight (2907 g), followed by Group 1 (Control group) (2860 g), Group 2 (Probiotics + *Salmonella* group) (2833 g), and Group 4 (*Salmonella* group) (2727 g). Mortality was also recorded. Mortality by the end of experiment was 2 deaths in Control and *Salmonella* groups. Probiotics + *Salmonella* group and Probiotics-only group had 1 death in each. Conclusion: These findings suggest that while probiotics may influence growth performance, the observed variations in body weight require further investigation to confirm their statistical and practical significance. *L. paracasei* SH1, isolated from shubat, demonstrated significant potential in improving broiler survival during *S. typhimurium* exposure, confirming its protective role. Slight reductions in growth highlight the need for optimizing probiotic dosages and formulations.

Keywords : broiler chickens, growth performance, *Salmonella*, Shubat, probiotics

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