



Effect of Three Types of Probiotics on Growth Performance and Sensory and Qualitative Indices of Breast Muscle in Broilers Exposed to Chronic Heat Stress

Kavian Rezaei^{1✉}, Seyedeh Alemeh Hosseinian^{2✉}, Sara Basiri^{3✉}, Kimiya Nader^{1✉}

¹ Graduated from the School of Veterinary Medicine, Shiraz University, Shiraz, Iran

² Department of Clinical Sciences, Avian Diseases Research Center, School of Veterinary Medicine, Shiraz University, Shiraz, Iran

³ Department of Food Hygiene, School of Veterinary Medicine, Shiraz University, Shiraz, Iran

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Abstract

BACKGROUND: Probiotics are of interest to researchers due to their beneficial effects in controlling the negative impacts of heat stress in broiler chickens.

OBJECTIVES: The present study was performed to investigate the effects of three different probiotics administered via drinking water on the growth performance and sensory and qualitative indices of breast meat in broilers under heat stress.

METHODS: A total of 150 one-day-old Cobb 500 broilers were divided into five groups (four replicates with 10 birds in each) in a completely randomized design. The treatment groups included: negative control (normal temperature), positive control (heat stress), HSBacil (heat stress and *Bacillus* probiotic), HSLAB (heat stress and *Lactobacillus* probiotic), and HSMix (heat stress and a mixture of *Bacillus* and *Lactobacillus* probiotics). Chronic heat stress induction and probiotic administration were performed from 21 to 42 days of age.

RESULTS: After the challenge, the broilers in the positive control group had lower feed intake and weight gain, as well as a greater feed conversion ratio compared to those in the negative control group. Broilers in the HSLAB and HSMix groups exhibited greater weight gain and a more favorable feed conversion ratio compared to those in the positive control group ($P<0.05$). There was no difference in weight gain between the broilers in the HSLAB and HSMix treatments compared to the negative control treatment. The sensory scores of the breast meat in the positive control group were lower than the negative control group ($P<0.05$). The use of probiotics improved the sensory indices of breast meat ($P<0.05$). The HSMix treatment showed no significant difference from the negative control treatment in most of the meat sensory indices. Peroxide value in fat tissue in positive control birds was greater than negative control birds ($P<0.05$). The peroxide value in the HSMix treatment was lower than the positive control treatment ($P<0.05$).

CONCLUSIONS: The results showed that *Bacillus* and *Lactobacillus* probiotics, individually or in combination, are effective in improving the growth performance and meat sensory indices, as well as reducing the peroxide value in broilers under heat stress. These probiotics can be a useful strategy to mitigate the negative effects of heat stress.

Keywords: Broiler, Growth performance, Heat stress, Meat quality, Probiotic

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Corresponding author: Seyedeh Alemeh Hosseinian, Tel/Fax: +9871-36138729/ +9821-32286940



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Figure Legends and Table Captions

Table 1. Composition and calculated analysis of the basal diets at various experiment phases.

Table 2. The effect of three different types of probiotics on the growth performance of broilers under chronic heat stress (Mean±SD).

Table 3. The effect of three different types of probiotics on crude fat, dry matter, ash and pH of breast meat in broilers under chronic heat stress (Mean±SD).

Table 4. The effect of three different types of probiotics on the texture indices of breast meat in broilers under chronic heat stress (Mean±SD).

Table 5. The effect of three different types of probiotics on the sensory indices of breast meat in broilers under chronic heat stress (Mean±SD).

Table 6. The effect of three different types of probiotics on the color indices of breast meat of in broilers under chronic heat stress (Mean±SD).

Figure 1. The effect of three different probiotics on the peroxide value in abdominal fat at 42 days of age in broilers exposed to chronic heat stress.

Figure 2. The effect of three different probiotics on water holding capacity (WHC) in the breast muscle of 42-day-old broilers exposed to chronic heat stress.