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The effects feed restriction, herbal growth promoters and probiotic on compensatory growth, immuno system and meat oxidative stability in broiler chickens

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Abstract

This experiment was conducted to determine the effects of herbal growth promoters such as thyme, oregano, thyme + oregano and probiotic following broiler chickens fed by feed restriction method in (8 to 14 days of age), on performance, carcass yield, nutrient digestibility, immunity, oxidative stability and peroxide index of meat in broilers. For this purpose, 480 male broiler chicks (Ross 308) were used from 1 to 42 days old. A 2×5 factorial experiment on the basis of completely randomized design was done with four replications. Experimental factors were: 2 feeding methods (*ad libitum* and feed restriction) and 5 feed additives. For applying feeding restriction in the first stage, broilers were divided into two separate experimental groups in which the first group was fed *ad libitum* as a control group but in the second group quantitative restriction on the amount of feed consumed was 25% lower than that of the *ad libitum* group from 7 to 14 days of age. In the next step, 300 g of essential oil of thyme, oregano, a mixture of them (as part of diet) and 250 g probiotic protoxin per ton of diet were used in both control and experimental groups. In the whole rearing period, the effects of feeding and the type of additive on feed intake were significantly lower than those of the *ad libitum* + additive and restriction + probiotic treatments ($P \leq 0.05$). The application of feed restriction had no beneficial effect on feed conversion ratio and mortality. Production index was higher as a result of consumption of feed additives than non-additive treatment ($P \leq 0.05$). The illium digestibility of dry matter, ash, crude protein and gross energy was lower in the non-additive treatment than in the additive treatment ($P \leq 0.05$). Improved oxidative stability of carcass and reduction of abdominal fat pad were observed when using probiotic and thyme + oregano ($P \leq 0.05$). Also, the type of additive used, especially probiotic and thyme + oregano had beneficial effects on the acidity of different parts of the gastrointestinal tract and microbial flora ($P \leq 0.05$). An increase in antibody titre against influenza vaccine was observed in the feed restriction method and the type of additive used in the post-restriction period, strengthened the immune system in thyme + oregano and probiotic treatments ($P \leq 0.05$). According to the results, the use of the aforementioned nutrient additives did not have any effect on compensatory growth after the the feed restriction, but probiotic and essential oil mixture of oregano + thyme improved feed conversion ratio, production index and meat oxidative

stability, improves nutrient digestibility, intestinal microbial flora, and boosting the immune system in broilers.

Key Words: Broiler chicken- Feed restriction –Immunity- Meat quality- Nutrient digestibility- Oregano- Performance- Thyme.