

EFFECT OF DRY HERBAL FEED ADDITIVE ON THE PERFORMANCE AND MEAT QUALITY OF TURKEYS BROILERS

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Abstract

In 2006, the European Union (EU) banned the use of antibiotics in animal feed to reduce the risk of antibiotic resistance to pathogens. Various plant species and their derivatives have been studied as possible alternatives to nutritional antibiotics used in animal husbandry. The aim of the present study was to determine the effect of the inclusion of 1% dry herbs in turkey feed (1% *Matricaria chamomilla*; 1% *Rosmarinus officinalis*; 1% *Lavandula angustifolia*; 1% *Origanum vulgare*; 1% *Thymus vulgaris*; and 1% *Hypericum perforatum*) on growing and slaughter traits, meat quality, and the production of functional foods.

Turkeys were reared in the poultry farm of the Agricultural Institute, Stara Zagora. A total of 105, 1 day-old of age female turkeys poults were weighed individually and were randomly allocated to 7 treatment groups (3 replicates per treatment and 5 birds per replicate) until 126 day old, namely: control (C) and experimentals (E1, E2, E3, E4, E5, E6). Control group turkeys received basal diet and without the herbal. The basal diet was formulated for starter, grower, and finisher growth periods. All diets were in mashed form. The experimental groups received basal diet plus 1% supplemented with dry herbs (1% *Matricaria chamomilla*; 1% *Rosmarinus officinalis*; 1% *Lavandula angustifolia*; 1% *Origanum vulgare*; 1% *Thymus vulgaris*; and 1% *Hypericum perforatum*). Each group was placed to a clean floor pen, in a brooder ring for the first seven days, with equal floor space, one feeder, one drinker and one heating lamp for each ring. The litter (wood shavings) was covered with paper during the first week to prevent the poults from eating the litter. Birds had *ad libitum* access to feed and water and lighting was provided continuous. Feed intake was measured based on residual feed deduction from the total supplied feed. Body weight (BW) and feed intake (FI) were recorded by treatment group, and FCR (feed conversion ratio) per group were then calculated for the total experimental period. At the end of the experiment, 35 turkeys (5 birds per group) representing the average body weight of each group were selected and after 12-h fasting time were slaughtered at the own experimental slaughterhouse. After evisceration the hot carcasses were weighed to evaluate dressing yield expressed as a percentage of preslaughter body weight. The water, protein and fat content in the meat was determined by Bulgarian quality certificate 15437: 1982, by Bulgarian quality Certificate 9374: 1982, and by Bulgarian quality Certificate 8549: 1992. pH value of the sample was determined 24 h after slaughter with by pH-meter "Testo 205" into the breast and thigh muscle (pH₂₄). The color of the meat was determined on the same muscles according to the CIE system with "Minolta CR-400" colorimeter (Osaka, Japan). Water holding capacity (WHC%) of the meat was determined by pressing according to the classical method. Cooking loss (%) was determined by roasting a sample of meat at 150 °C for 20 minutes in a forced convection oven. The percentage of losses was determined as the difference in the mass of the samples before and after firing. The fatty acid content of breast and thigh samples was determined of gas chromatography after extraction and transformation of fatty acids in methyl esters. Fatty acids were expressed as a percentage of the sum of identified fatty acids. Statistical analyses were conducted with Statistica program, ver. 10 (StatSoft, Inc., 2011).

The addition of dried herbs to the broiler turkey feed did not affect the final live weight at 126 days of age and the conversion of feed throughout the rearing period at $p > 0.05$. No proven differences were found in slaughter yield (%), breast (%), thigh (%) and wings (%). Significant differences at $p < 0.05$ were observed in back (%), gizzard (%) and liver (%) between the control group and the experimental groups. There were no differences ($p > 0.05$) in the percentage of moisture, protein and fat in breast and thigh meat in the studied groups. There is no effect on pH₂₄ of breast and thigh meat from the addition of dried herbs to the feed. The values of L*, a* and b* of the breast meat showed differences between the different study groups at $p < 0.05$.

Cooking loss (%) values in breast meat in the present study were highest in the control group (C) 35.12%, followed by the groups (E2) - 27.54%, (E4) - 27.14%, (E5) - 26.2%, (E3) - 25.64%, (E1) - 22.2%, and the lowest - 18.37% in the group (E6) at $p < 0.05$. WHC (%) values in thigh meat in this study were the highest in the group E1 - 23.82% and the lowest in the control group - 17.12% at $p < 0.05$. Unsaturated and saturated fatty acids in breast and thigh meat did not show significant differences between groups.

Further research is needed to expand knowledge about the addition of dried herbs to the diet of turkeys and to increase the opportunity of obtaining functional foods from them.

Key words: *Turkeys, Performance, Dry herbs, Quality meat, Fatty acids.*