

PERFORMANCE OF LAYING HENS FED DIETS SUPPLEMENTED WITH PROBIOTICS AND PREBIOTICS

Mitko Lalev¹, Nadya Mincheva¹, Pavlina Hristakieva^{1*},
Magdalena Oblakova¹, Ivelina Ivanova¹

¹Agricultural Academy, Agricultural Institute - Stara Zagora, Radnevska road 1,
6000 Stara Zagora, Bulgaria

*e-mail: poly_31@abv.bg

Abstract

The complete ban on the use of nutritional antibiotics as stimulants of productivity in poultry induce interest in the use of microbial products in feed to replace the effect of antibiotics. Numerous studies have reported that their addition to feed leads to better productivity in poultry. The aim of the present study was to determine the effect of the application of natural biologically active feed additives (two probiotics- PRO 1 and PRO 2) and prebiotic (PRE) on performance of laying hens, including the egg productivity, egg weight, feed intake, morphometric parameters of eggs.

The experiment was conducted with 480 laying hens (34 weeks of age), divided into four treatment groups (6 replicates of 20 birds, each) according to the following experimental scheme: (1) basal diet of no additive (control), (2) basal diet + 0.05% PRO 1, (3) basal diet + 0.05% PRO 2, and (4) basal diet + 0.2% PRE for the period of 13 weeks. Feed and water were offered ad libitum. The following parameters were controlled during the experimental period: body weight of the hens (at the beginning and at the end of the experiment), feed consumption, egg production, average egg weights and total egg mass for each replicate. Eggs were collected daily, and egg production was expressed on a hen-day basis (% hen-day). The feed conversion ratio was calculated by the amount of feed intake divided by the egg mass. At the end of the trial, 30 eggs per treatment were collected (5 eggs per replicate) in order to evaluate the most important morphometric characteristics of eggs, including egg weight, egg white, yolk and shell, shell thickness and yolk color, determined by the La Roche scale. All data were analyzed by the general linear model procedure of statistical software SPSS (ver.19.0) and when the means were significant ($P < 0.05$), LSD test was used to determine treatments difference.

In this study, the addition of the prebiotic to the feed resulted in a significant increase in body weight of the laying hens at the end of the experiment. The tested products showed no effect on the average egg weight for the whole experimental period. The intensity of laying of the control group and those treated with probiotics was an unproven difference. The group with addition of the prebiotic product ($P < 0.05$) was distinguished with lower laying intensity. The amount of egg weight is lower when prebiotic is added. Less efficient feed utilization was observed in the experimental group with the addition of prebiotic, compared to the other groups, due to the reported lower laying capacity ($P < 0.05$). The quality characteristics of the eggs did not show significant differences between the control and experimental groups. The yolk color was characterized by more intense staining with the addition of PRO 1, on the La Roche scale compared to other experimental groups, and no proven differences with the control were observed.

Probiotics or prebiotics can be used successfully as an alternative to antibiotic stimulants to maintain the health and productivity of laying hens.

Key words: Probiotic, Prebiotic, Laying hen, Egg production, Egg quality.