EFFECT OF DIETARY OMEGA-3 FATTY ACID ON THE PERFORMANCE OF LAYING HEN AND THE FATTY ACID COMPOSITION OF EGG YOLK

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ABSTRACT

The aim of the research was to identify omega – 3 egg production and determine effects of different combinations of soya oil and fish oil on the performance of laying hens and on the profile of fatty acids in egg yolks, especially on n-3 poly unsaturated fatty acid (PUFA) when such oils are added to the diet of laying hens. The research was carried out on 60 laying hens of the Hy – line hybrid (white) ranging in age from 26 to 30 weeks old. Hens were divided into five groups (6 laying hens per group) and fed with a formulated mixture (that contained 17.17% of crude protein and 2860 K cal/Kg ME. The research lasted for 30 days.

The control Group (T5) was given diets without oil supplemented. But 6% added Maize and experimental groups T1, T2, T3 and T4 were fed diets that contained a combination of fish and soya oils in different amounts. Diets given to the T1 group contained 6% of fish oil, while the T2 group was fed diets with 4% of fish oil and 2.0% Soya oil, while the T3 Group was fed diets with 2% of fish oil and 4.0% Soya oil, while the T4 Group was fed diets with 6% of soya oil.

Production characteristics of hens were monitored during the whole experiment. Portion of saturated (SFA) and Unsaturated Fatty acids (MUFA and PUFA) as well as alpha-linolenic (alpha- LNA C: 18: 3n-3) eicosapantaenoic (EPA, C20:5n-3) and docosahexaenoic (DHA C22:6n-3) acid were shown as a percentage of total fatty acids contained in yolk. There were not statistically significant differences ($P<0.05$) in the hens feed consumption, percentage of HDP, egg weight, egg yolk weight, Albumin weight and shell weight. Egg Quality parameter egg shape index and yolk colour also not shown statistically significant.

The portion of SFA in total fatty acids contained in yolk shown higher percentage T5(control)groups,(36.54%)andfollowingT1groups(33.41%)T2,T3,T4groups (31.18%,31.46%,31.65%) respectively .Higher content of MUFA was noticed in T1, T2, T3, T4 groups, if compared to the control (35.25%) (T1-42.85%, T2-42.37%, T3-40.77%, and T4-36.95%). Higher content of linolic acid was notified T4 groups(26.35%) but lowest group T1(16.62%),content of linolinic acid was sown higher percentage of T3 group, lowest control group (0.65%),content of DHA highest T1 group (4.54%) and lowest control group(0.21%). Total omega-3 PUFA was increased in the T1 group for 5.51%, T2 group for 5.48%, T3 group for 3.69%, T4 group for 2.6% and the control group 0.86%. The ratio of n-6/n-3 PUFA was the lowest in egg yolk of the T1 group (3.34) followed by that of the T2 group (4.01), T3 group (6.56), T4 group (11.05) and finally that of the control group (24.37)

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