Journal of Research in Ecology

ISSN No: Print: 2319 –1546; Online: 2319-1554

An International Scientific Research Journal

The effect of adding different levels of Evening Primrose Oil (EPO) to laying hens diet on quality traits, fatty acids content, cholesterol and lipid oxidation of the egg yolk

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ABSTRACT:

A research was conducted to evaluate the effect of feeding different levels of Evening Primrose Oil (EPO) on the quality of traits, fatty acids content, cholesterol and the oxidation status indicators of the egg after storage for 14 days. Two hundred forty, thirty one-week-old Isa Brown hens were divided into four treatments (each treatment had three replicates, 20 birds per replicate), fed for 20 weeks divided into five periods included: period 1 (31-34 weeks), period 2 (35-38 weeks), period 3 (39-42 weeks), period 4 (43-46 weeks), and period 5 (47-50 weeks). The treatments included were: T_1 (control) – basal diet without supplementation, T_2 basal diet + 25% of EPO, T_3 basal diet + 50% of EPO, T_4 basal diet + 75% of EPO. The results of this study showed a significant ($P<0.05$) improvement in each of the relative weight of yolk and yolk index in T_2, T_3, and T_4 and for all periods compared to T_1. Furthermore, a significant improvement in the content of egg yolk in proportion of unsaturated fatty acids (linoleic acid and gamma linolenic acid was seen). An increase in gamma linolenic acid with increasing levels of EPO was noted in T_2, T_3, T_4 compared to T_1. Significantly, the proportion of egg cholesterol showed a decrease in T_4 when the addition of EPO was 75%. After 14 days of storage, lipid oxidation indicators which consist of peroxide (PV), Malondialdehyde (MDA), and Free Fatty Acids (FFA) were significantly decreased in T_2, T_3, T_4 compared to T_1. It can be concluded that addition of EPO to laying hen diets improved the unsaturated fatty acid especially linoleic and gamma linolenic acids and enhanced egg quality.

Keywords:
Evening primrose oil, Fatty acids content, Egg yolk, Lipid oxidation.