

## Effects of Four Dietary Oils on Cholesterol and Fatty Acid Composition of Egg Yolk in Layers

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**Abstract :** Dietary cholesterol has elicited the most public interest as it relates with coronary heart disease. Thus, humans have been paying more attention to health, thereby reducing consumption of cholesterol enriched food. Egg is considered as one of the major sources of human dietary cholesterol. However, an alternative way to reduce the potential cholesterolemic effect of eggs is to modify the fatty acid composition of the yolk. The effect of palm oil (PO), soybean oil (SO), sesame seed oil (SSO) and fish oil (FO) supplementation in the diets of layers on egg yolk fatty acid, cholesterol, egg production and egg quality parameters were evaluated in a 42-day feeding trial. One hundred and five Isa Brown laying hens of 34 weeks of age were randomly distributed into seven groups of five replicates and three birds per replicate in a completely randomized design. Seven corn-soybean basal diets (BD) were formulated: BD+No oil (T1), BD+1.5% PO (T2), BD+1.5% SO (T3), BD+1.5% SSO (T4), BD+1.5% FO (T5), BD+0.75% SO+0.75% FO (T6) and BD+0.75% SSO+0.75% FO (T7). Five eggs were randomly sampled at day 42 from each replicate to assay for the cholesterol, fatty acid profile of egg yolk and egg quality assessment. Results showed that there were no significant ( $P>0.05$ ) differences observed in production performance, egg cholesterol and egg quality parameters except for yolk height, albumen height, yolk index, egg shape index, haugh unit, and yolk colour. There were no significant differences ( $P>0.05$ ) observed in total cholesterol, high density lipoprotein and low density lipoprotein levels of egg yolk across the treatments. However, diets had effect ( $P<0.05$ ) on TAG (triacylglycerol) and VLDL (very low density lipoprotein) of the egg yolk. The highest TAG (603.78 mg/dl) and VLDL values (120.76 mg/dl) were recorded in eggs of hens on T4 (1.5% sesame seed oil) and was similar to those on T3 (1.5% soybean oil), T5 (1.5% fish oil) and T6 (0.75% soybean oil + 0.75% fish oil). However, results revealed a significant ( $P<0.05$ ) variations on eggs' summation of polyunsaturated fatty acid (PUFA). In conclusion, it is suggested that dietary oils could be included in layers' diets to produce designer eggs low in cholesterol and high in PUFA especially omega-3 fatty acids.

**Keywords :** dietary oils, egg cholesterol, egg fatty acid profile, egg quality parameters

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