

ENRICHMENT OF CONJUGATED LINOLEIC ACID (CLA) IN EGG YOLK USING SEEDS OF BITTER MELON (*MOMORDICA CHARANTIA*)

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Conjugated Linoleic Acid (CLA), a group of isomers of linoleic acid (18:2, 9c, 11t and 10t, 12c) is reported with numerous health benefits such as anti-cancer and anti-obese actions. Natural sources of CLA are milk and meat from ruminants. It has been reported that a conjugated trienoic fatty acid named α -eleostearic acid (ESA; 18:3: 9c, 11t, 13t) present in bitter melon seeds (*Momordica charantia*) is converted into 9c, 11t isomer of CLA *in vivo* within animal models such as rats. This study was designed to determine whether α -eleostearic acid incorporated into a poultry layer feed is converted into CLA in birds' body and deposited in egg yolk lipids. Bovans white, single comb, laying hens (n=6, 75 weeks old) were randomly assigned to two groups; one group was supplemented with bitter melon seed powder (ESA 1.5%; Treatment). The other group was maintained as the control group (ESA 0.0%). Eggs were collected daily for 28 days. Feed consumption and egg quality characteristics were monitored. Eggs collected on 28th day were used for the analysis of CLA content. Fat contents of eggs were extracted using a standard method and pooled separately in control and treatment groups. Fatty acid profiling was performed using gas chromatography/mass spectrometry (GC/MS). The addition of ESA rich bitter melon seed powder significantly increased ($p < 0.05$) the feed consumption (Control; 65.20 ± 5.09 , Treatment: 92.40 ± 3.17 g/hen/day) and egg quality characteristics such as egg weights (Control; 57.14 ± 0.92 , Treatment: 64.71 ± 0.87 g) and egg yolk weights (Control; 18.58 ± 0.52 , Treatment: 20.37 ± 0.34 g). The CLA levels in two groups at 28 d were reported as 0.0% and 1.4% in fatty acid profiles of control and treatment groups, respectively. Thus, birds fed a diet with Bitter Melon seed powder that contains ESA enhanced the CLA levels in egg yolk lipids. The results revealed that the conversion of ESA to CLA occurs in poultry layers and this natural source (bitter melon seed fat) can be effectively used to enrich table eggs with CLA and would be a means of value addition to the layer industry.

Keywords: α -eleostearic acid, Conjugated linoleic acid, Egg yolk, Laying hens, *Momordica charantia*