

**PRODUCTION OF DESIGNER EGGS FORTIFIED  
WITH OMEGA-3 FATTY ACIDS**

A dissertation submitted to the  
Faculty of Animal Science and Export Agriculture  
Uva Wellassa University  
in partial fulfillment of the requirement of  
the degree of  
Bachelor of Animal Science

By

**MARASINGHE PRINS INDUNIL LAKMINI  
AMARASOORIYA**

**Animal Science Degree Programme  
Faculty of Animal Science and Export Agriculture  
Uva Wellassa University**

**2013**

## ABSTRACT

Egg serves as an excellent source of protein, fats, minerals and vitamins. A high proportion of omega-6 polyunsaturated fatty acids (PUFA) and a low proportion of omega-3 PUFA are contained in the yolk of an ordinary egg. Omega-3 fatty acids are considered essential fatty acids which cannot be synthesized by the body. Two crucial Docosahexaenoic Acid (DHA) and Eicosapentaenoic Acid (EPA) are primarily found in certain fish. This research was carried out to increase the fatty acid level of chicken egg and compare the growth and production performance of laying hens by incorporating fish oil in to the hen's diet. Two different treatments along with the control were conducted during this study. In control, existing feed formula without fish oil was given for the selected groups of birds. In treatment I, 1% of fish oil was added in to the existing feed formula and in treatment 2, 2% of fish oil was added in to the feed formula. Egg yield, body weight of selected birds and average weight of an egg were recorded weekly. Up to third week two eggs were collected and after third week 12 eggs were collected from each replicate. In chemical analysis as omega-3 polyunsaturated fatty acids (PUFA) Docosahexaenoic Acid (DHA) and Eicosapentaenoic Acid (EPA) composition were analyzed using Gas Chromatography. Body weight of selected birds, egg yield and average weight of an egg were analyzed using analysis of variance (ANOVA) using SAS 9.1.3. According to the results, treatments are significantly affected ( $P < 0.05$ ) for body weights of birds. According to the chemical analysis eggs taken from the control groups contained 57.2 mg DHA/egg and 1.9 mg EPA/egg. Eggs obtained from the Treatment 2 contained 654.2 mg DHA/ egg and 106.1 mg EPA/ egg. Incorporating fish oil contained omega 3 fatty in to feed, the amount of DHA and EPA will increase significantly in chicken egg. Therefore 2% fish oil can be added in to the hen's feed.

Key words: omega-3 ( $\omega$ -3/n-3) fatty acids, polyunsaturated fatty acids, Docosahexaenoic Acid, Eicosapentaenoic Acid, Gas chromatography.