

Multimineral Fortification of Chicken Egg by Supplementing Sodium Selenite, Ferrous Sulphate and Zinc Sulphate

R. M. D. Pushpamali¹, M. Gunawardene², K. Samarasinghe¹, R. Chandrajith³, S. M. C. Himali^{1*}

¹ Department of Animal Science, Faculty of Agriculture, University of Peradeniya, Peradeniya 20400, Sri Lanka

² Sri Lanka Institute of Nanotechnology, Mahenwatte, Pitipana, Homagama 10200, Sri Lanka

³ Department of Geology, Faculty of Science, University of Peradeniya, Peradeniya 20400, Sri Lanka

*chimali@pdn.ac.lk

The fortification of eggs can be used to alleviate micronutrients deficiencies in humans successfully. A study was conducted to investigate the effect of Sodium selenite (Na_2SeO_3), Ferrous sulphate (FeSO_4) and Zinc sulphate (ZnSO_4) incorporated diet on Selenium (Se), Iron (Fe) and Zinc (Zn) concentrations of eggs, egg quality and productivity traits of layers. The dietary treatments were basal diet and basal diet plus Na_2SeO_3 , FeSO_4 and ZnSO_4 with the concentrations of Se 0.3 mg/kg, Fe 120 mg/kg and Zn 150 mg/kg. Concentrations of Se, Fe and Zn in egg samples were determined by using inductively coupled plasma mass spectrometer. The Haugh unit, shape index, yolk index, egg weight, eggshell strength, air cell depth, shell thickness and yolk color were measured weekly and a sensory evaluation of hard boiled eggs was carried out. Supplementation of minerals increased Se and Zn concentration in egg white by 28.6% and 50.9% ($P < 0.05$) respectively. Fe concentration in egg yolk was increased by 15.7% ($P < 0.05$). Feed intake/hen/day, egg production/hen/week and feed conversion ratio/kg eggs were not significantly different among the treatment and control ($P > 0.05$). Egg quality characteristics showed a positive improvement, but with no statistically significant difference compared to the control group ($P > 0.05$). Mineral supplemented diet markedly increased ($P < 0.05$) egg weight and egg white weight than the control. Higher consumer preference was recorded to the yolk color ($P > 0.05$) of mineral fortified eggs than the control. Mineral supplemented diet with Na_2SeO_3 (0.3 mg/kg), FeSO_4 (120 mg/kg) and ZnSO_4 (150 mg/kg) can be recommended to fortification of eggs with Se, Fe and Zn successfully and, it results positive improvements in egg quality. The egg production parameters are not affected by the fortification concentrations and combination used in the current study.

Key words: Chicken egg fortification, Iron, Laying hen, Selenium, Zinc