

Effect of antioxidant supplementation and refrigerated storage on fatty acid profile, tocopherols and oxidative stability of omega-3 enriched eggs

Zafar Hayat^{*1,2}, Gita Cherian³, Talat Naseer Pasha¹ and Farina Malik Khattak¹

1University of Veterinary & Animal Sciences, Lahore, Pakistan

2University College of Agriculture, University of Sargodha, Sargodha, Pakistan.

3Department of Animal Sciences, Oregon State University, Corvallis, USA.

Summary

An experiment was conducted to investigate the effect of dietary n-3 fatty acids, antioxidants and storage on egg fatty acids, oxidative stability and vitamin E content. Eggs were collected from ISA Brown layers fed diets containing corn-soy (Control) or 10% flax seed and two types of antioxidants (α -tocopherols, butylated hydroxy toluene, [BHT] at 0, 50, 100, 150 IU or mg/kg). Eggs were stored at 4°C for 60 days. Eggs from hens fed flax had increased α -linolenic, eicosapentaenoic (EPA), and docosahexaenoic (DHA) acids and decreased arachidonic acid and total n-6:n-3 ratio when compared to Control eggs ($P < 0.05$). Storage over twenty days decreased EPA, 22:5 n-3, 22:5 n-6 in the eggs from Control and Flax diets ($P < 0.05$). Egg DHA was more stable during storage ($P > 0.05$) and antioxidants had no effect on DHA upon storage ($P > 0.05$). Inclusion of tocopherols led to over 4.5 to 12-fold increase in tocopherols in eggs. Storage for 40 days or longer led to over 50% reduction in egg tocopherols ($P < 0.05$). Feeding flax seeds led to an increase in TBARS in eggs ($P < 0.05$). α -tocopherol was better in preventing lipid oxidation than BHT at day zero storage. However, both antioxidants had minimal effect on TBARS upon 60-day storage ($P > 0.05$).

