

Chemical compositions of egg yolks and egg quality of laying hens fed prebiotic, probiotic and synbiotic diets

ABSTRACT

A 16-wk feeding experiment was conducted to investigate the effects of a prebiotic, isomaltooligosaccharide (IMO), a probiotic, PrimaLac®, and their combination as a synbiotic on the chemical compositions of egg yolks and the egg quality of laying hens. One hundred and sixty 16-wk-old Hisex Brown pullets were randomly assigned to 4 dietary treatments: (i) basal diet (control), (ii) basal diet + 1% IMO (PRE), (iii) basal diet + 0.1% PrimaLac® (PRO), and (iv) basal diet + 1% IMO + 0.1% PrimaLac® (SYN). PRE, PRO, or SYN supplementation not only significantly ($P < 0.05$) decreased the egg yolk cholesterol (24- and 28-wk-old) and total saturated fatty acids (SFA; 28-, 32-, and 36-wk-old), but also significantly ($P < 0.05$) increased total unsaturated fatty acids (UFA; 28-, 32-, and 36-wk-old), total omega 6 and polyunsaturated fatty acids (PUFA), including linoleic and alpha-linolenic acid levels in the eggs (28-wk-old). However, the total lipids, carotenoids, and tocopherols in the egg yolks were similar among all dietary treatments in the 24-, 28-, 32-, and 36-wk-old hens. Egg quality (Haugh unit, relative weights of the albumen and yolk, specific gravity, shell thickness, and yolk color) was not affected by PRE, PRO, or SYN supplementation. The results indicate that supplementations with IMO and PrimaLac® alone or in combination as a synbiotic might be useful for improving the cholesterol content and modifying the fatty acid compositions of egg yolk without affecting the quality of eggs from laying hens between 24 and 36 wk of age.

Keyword: Cholesterol; Fatty acid composition; Prebiotic; Probiotic; Synbiotic