بحث رقم (7)

Research Title :	**Impact of dietary inclusion of black soldier fly larvae (*Hermetia illucens*) as a replacement for soybean-corn ingredients on egg production, physiological status, and economic efficiency of laying hens.**
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Abstract: In the recent years, insect meals have been introduced as efficient and inexpensive sources of protein and energy in poultry nutrition. The current study was conducted to explore the possible impact of soybean-corn replacement with various levels of black soldier fly larvae *Hermetia illucens* (BSFL) meal on egg production, egg quality, physiological aspects and economic efficiency of laying hens. The study employed 270 commercial layers, 40-wk-old, that belonged to the W-36 *Hy-Line* chickens. The layers were randomly designated into five equal treatment groups (9 replicates × 6 hens per replicate for each treatment) according to the dietary inclusion levels of BSFL meal. The first group of birds were fed a basal diet of soybean-corn meals and served as a control (0% BSFL meal), while the remaining 4 groups were fed a basal diet in which the soybean-corn meals were partially replaced with 3%, 6%, 9%, and 12% BSFL meals, respectively. The experimental trial continued for 10 consecutive weeks from 40 to 50 wk of age. One-way analysis of variance (ANOVA) including a polynomial test was carried out to explore the linear and quadratic contrasts of increasing the BSFL levels on all the parameters. The results of this study showed a linear improvement ($p < 0.05$) in the egg production (by 3.38 percent points than control), egg weight (by 1.54 g than control), feed conversion (by 20% than control), and egg quality traits, such as Haugh unit, yolk color, shell strength, and shell thickness, with the increase in the BSFL

inclusion levels into the layer diets. The BSFL treatment linearly ($p < 0.05$) augmented the concentration of total protein, triglycerides, cholesterol, and calcium in the plasma. Furthermore, a linear increasing effect ($p < 0.05$) on the T3 and E2 hormone concentrations and on the humoral and cellular immune response were obtained as the dietary BSFL level increased. Moreover, BSFL treatment linearly increased the profit margin, the cost benefit ratio and the return on investment per bird, recording the highest economic efficiency when employing 12% BSFL in the layer diets. Our results conclude that each 3% of the soybean meal in the laying hen's diet can be replaced by 1% of the BSFL meal to achieve favorable outcomes on the performance, the physiological mechanisms, and the economic profits of egg production.