

PENINGKATAN KUALITAS TELUR DAN EKSPRESI GEN ANTIOKSIDAN AYAM PETELUR DENGAN PENAMBAHAN SELENIUM ORGANIK DALAM PAKAN

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INTISARI

Selenium merupakan mineral esensial yang bermanfaat untuk kesehatan dan produktivitas ternak. Selenium berperan penting dalam sistem pertahanan antioksidan dengan menurunkan oksidasi radikal bebas. Penelitian ini bertujuan untuk mengetahui pengaruh penambahan selenium organik terhadap kualitas telur dan ekspresi gen antioksidan ayam petelur. Sebanyak 126 ekor ayam petelur umur 88 minggu strain *Lohmann Brown* dibagi menjadi tiga kelompok perlakuan. Setiap kelompok perlakuan terdiri dari 6 ulangan dengan 7 ekor ayam setiap ulangan. Perlakuan terdiri dari CTRL (pakan basal tanpa penambahan Se), Se300 (pakan basal + Se 300 g/ton), dan Se600 (pakan basal + Se 600 g/ton). Perlakuan pakan diberikan selama 3 bulan. Parameter penelitian yang diamati meliputi kualitas telur eksterior dan interior, jumlah telur *crack*, warna kerabang telur, kandungan selenium dan immunoglobulin Y (IgY) telur, dan ekspresi gen antioksidan ayam petelur. Hasil penelitian menunjukkan bahwa penambahan selenium organik meningkatkan lebar telur di bulan ke-3 ($P < 0,05$) dan meningkatkan nilai b^* (*yellowness*) warna kerabang telur ($P < 0,05$). Penambahan selenium organik meningkatkan kandungan selenium dan IgY telur ($P < 0,001$). Penambahan selenium organik sebanyak 600 g/ton mampu meningkatkan ekspresi gen GPx1, SOD1, CAT, dan Nrf2 pada jaringan hati ($P < 0,01$), serta meningkatkan ekspresi gen GPx1 dan CAT pada jaringan *magnum* ($P < 0,01$). Berdasarkan hasil penelitian, dapat disimpulkan bahwa penambahan selenium organik sebanyak 300 g/ton aman dan efektif untuk meningkatkan kualitas telur dan ekspresi gen antioksidan ayam petelur.

Kata kunci: antioksidan, ekspresi gen, selenium, telur, unggas

ENHANCING EGG QUALITY AND ANTIOXIDANT GENE EXPRESSION IN LAYING HENS WITH DIETARY ORGANIC SELENIUM SUPPLEMENTATION

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ABSTRACT

Selenium is an essential trace mineral that beneficial for health promotion and production of animals. Selenium plays a vital role in antioxidant defense, as it prevents oxidative damage caused by free radicals. This study aimed to investigate the effects of dietary organic selenium supplementation on egg quality and antioxidant gene expression in laying hens. A total of 126 Lohmann Brown hens (88 weeks of age) were randomly divided into 3 treatments, each treatment consisted of 6 replicates with 7 birds per replicate. The treatments in the study were as follows: CTRL (basal diet without selenium supplementation), Se300 (basal diet + 300 g/ton organic selenium), and Se600 (basal diet + 600 g/ton organic selenium). The study was conducted for 3 months. The parameters observed in the study were external and internal egg quality, the number of cracked eggs, eggshell color, selenium and immunoglobulin Y (IgY) content in egg, and antioxidant gene expression in laying hens. The results showed organic selenium supplementation significantly increased egg width in the third month ($P < 0.05$) and b^* value (yellowness) of eggshell color ($P < 0.05$). Organic selenium supplementation significantly enhanced selenium and IgY content in egg ($P < 0.001$). Organic selenium supplementation at 600 g/ton significantly upregulated the expression of GPx1, SOD1, CAT, and Nrf2 in the liver tissue ($P < 0.01$) and GPx1 and CAT expression in the magnum tissue ($P < 0.01$). Based on the study, dietary organic selenium supplementation at 300 g/ton was safe and effective in enhancing egg quality and the antioxidant gene expression in laying hens.

Keywords: antioxidant, egg, gene expression, poultry, selenium