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共轭亚油酸对蛋鸡生产性能、蛋壳质量和血清生化指标的影响

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Dietary Conjugated Linoleic Acid Level Affects Performance, Eggshell Quality and Serum Biochemical Indices of Laying Hens

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摘要 为了研究共轭亚油酸(CLA)对蛋鸡生产性能和蛋壳质量的影响及机理,试验选用40周龄健康、体重和产蛋率相近的海兰白蛋鸡480只,采用单因素试验设计,随机分为4组,每组3个重复,每个重复40只,试验组分别添加0.5%、1.0%和2.0%的CLA,对照组不添加,试验期8周。试验结束时,每组选6只采血并屠宰,测定血清中三碘甲腺原氨酸(T_3)、四碘甲腺原氨酸(T_4)、皮质醇、雌二醇(E_2)、钙离子、磷离子含量和碱性磷酸酶(ALP)活性及肝脏肉毒碱棕榈酰转移酶(CPT- I)活性。结果表明:1)各试验组蛋鸡生产性能与对照组均差异不显著($P>0.05$)。2)各试验组蛋壳强度均显著大于对照组($P<0.05$),蛋壳厚度均差异不显著($P>0.05$)。3)2.0%CLA组蛋鸡血清 T_3 、 T_4 、皮质醇和 E_2 含量显著高于对照组及0.5%和1.0%CLA组($P<0.05$);各试验组蛋鸡血清钙、磷离子浓度与对照组差异不显著($P>0.05$);0.5%和1.0%CLA组蛋鸡血清ALP活性显著高于对照组($P<0.05$)。4)1.0%和2.0%CLA组蛋鸡肝脏CPT- I活性显著低于对照组($P<0.05$)。由此可见,在本试验条件下,饲料添加1.0%的CLA能显著提高蛋鸡血清中ALP活性,并在一定程度上促进 E_2 的分泌,显著提高蛋壳强度,且不影响蛋鸡的生产性能。

关键词: CLA 生产性能 蛋壳质量 血清生化指标 ALP 内分泌激素 CPT- I

Abstract: This experiment was conducted to investigate the effects of the supplementation of conjugated linoleic acid (CLA) on the performance, eggshell quality, and its mechanism. Four hundred and eighty healthy 40-week-old Hy-Line White laying hens with similar body weight and laying rate were divided randomly into 4 groups with 3 replicates per group and 40 birds in each replicate. The control diet had no CLA, and the experimental diets contained 0.5%, 1.0% and 2.0% CLA, respectively. Eight weeks later, six of each group was slaughtered and the blood was collected to determine the contents of thiothyone (T_3), tetraiodothyronine (T_4), cortisol, estradiol (E_2), Ca^{2+} and P^{5+} , the alkaline phosphatase activity (ALP) in serum, and the carnitine palmitoyltransferase (CPT- I) activity in liver. The results showed as follows: 1) there was no significant difference in performance between the control group and experimental groups ($P>0.05$). 2) Compared with the control group, the eggshell strength in experimental groups was significantly improved ($P<0.05$), but there was no significant difference in eggshell thickness between the control group and experimental groups ($P>0.05$). 3) The contents of T_3 , T_4 , cortisol and E_2 in serum of laying hens in 2.0% CLA group were significant higher than those in the other groups ($P<0.05$); there were no significant differences in the contents of calcium ions and inorganic phosphorus ions in serum of laying hens between the control group and experimental groups ($P>0.05$); compared with the control group, the ALP activity in serum of laying hens in experimental groups was significantly increased ($P<0.05$) except for 2.0% CLA group. 4) The CPT- I activity in liver of laying hens was significantly lower than that in the control group ($P<0.05$). It is concluded that 1.0% CLA can significantly increase serum ALP activity, and improve serum E_2 content, so it can significantly improve the eggshell strength, furthermore, it has no bad effect on performance of layers.

Keywords: conjugated linoleic acid, performance, eggshell quality, serum biochemical indices, alkaline phosphates, endocrine hormones, carnation palmitoyltransferase

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