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孵化期注射叶酸对肉仔鸡生产性能及免疫功能的影响

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Injecting Folic Acid during Incubation Period: Effects on Performance and Immune Function of Broilers

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- 摘要
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摘要 本试验旨在研究在种蛋孵化11胚龄注射不同水平叶酸对出生后肉仔鸡生产性能及免疫功能的影响。选用114枚萨索肉鸡种蛋,随机分为3组:生理盐水组,每枚种蛋注射0.1 mL生理盐水;45 μg 叶酸组和90 μg 叶酸组,每枚种蛋分别注射含45和90 μg 叶酸的0.1 mL的生理盐水。孵化后每组4个重复,每个重复6只鸡。孵化期21 d,饲养期42 d。结果表明:1)孵化期注射叶酸有提高1日龄肉仔鸡体重的趋势($P=0.110$);与生理盐水组比较,注射叶酸提高了21日龄和42日龄肉仔鸡体重($P=0.055$; $P=0.069$)及1~21日龄和22~42日龄肉仔鸡平均日增重($P=0.047$; $P=0.024$),而对1~21日龄及22~42日龄肉仔鸡平均日采食量和料重比无显著影响($P>0.10$)。2)孵化期注射不同水平叶酸对42日龄肉仔鸡法氏囊指数及21日龄和42日龄肉仔鸡脾脏指数均无显著影响($P>0.05$);与生理盐水组比较,90 μg 叶酸组1日龄肉仔鸡脾脏指数显著提高($P<0.05$);与45 μg 叶酸组比较,生理盐水组和90 μg 叶酸组1日龄肉仔鸡法氏囊指数显著提高($P<0.05$);与生理盐水组比较,45 μg 叶酸组21日龄肉仔鸡法氏囊指数显著提高($P<0.05$)。3)孵化期注射不同水平叶酸对1日龄肉仔鸡血浆叶酸含量及1日龄、21日龄和42日龄肉仔鸡血浆总蛋白、白蛋白含量均无显著影响($P>0.05$);相比生理盐水组和90 μg 叶酸组,45 μg 叶酸组1日龄肉仔鸡血浆球蛋白含量显著提高($P<0.05$)。4)孵化期注射不同水平叶酸对1日龄肉仔鸡肝脏总抗氧化能力、谷胱甘肽过氧化物酶活性及丙二醛含量均无显著影响($P>0.05$)。5)孵化期注射不同水平叶酸对28日龄肉仔鸡血液CD4⁺比例、CD4⁺/CD8⁺及40日龄肉仔鸡血液CD4⁺比例、CD8⁺比例和CD4⁺/CD8⁺均无显著影响($P>0.05$);与生理盐水组比较,45 μg 叶酸组显著降低了28日龄肉仔鸡血液CD8⁺比例($P<0.05$)。由此可知,孵化期11胚龄注射叶酸可改善肉仔鸡的生产性能。

关键词: 叶酸 生产性能 免疫功能 肉仔鸡

Abstract: This experiment was conducted to investigate the effects of injecting different levels of folic acid at 11 embryonic ages during incubation period on performance and immune function of broilers. A total of 114 (Sasso) hatching eggs were randomly subjected to one of the following 3 groups: saline group (injected 0.1 mL saline per egg), 45 μg folic acid group (injected 0.1 mL saline with 45 μg folic acid per egg) and 90 μg folic acid group (injected 0.1 mL saline with 90 μg folic acid per egg). Each group was allocated to 4 replicates with 6 broilers per replicate after incubation. The incubation period was 21 days and the feeding period was 42 days. The results showed as follows: 1) injecting folic acid during incubation period had an increasing trend in the body weight of 1-day-old broilers ($P=0.110$), and compared with saline group, injecting folic acid significantly increased the body weight of broilers aged 21 and 42 days ($P=0.055$; $P=0.069$), and the average daily gain (ADG) of broilers aged 1 to 21 days and 22 to 42 days ($P=0.047$; $P=0.024$), while had no significant effects on the average daily feed intake (ADFI) and feed/gain (F/G) of broilers aged from 1 to 21 days and from 22 to 42 days ($P>0.10$). 2) Injecting folic acid during incubation period had no significant effects on the index of bursa of Fabricius of broilers aged 42 days and the spleen index of broilers aged 21 and 42 days ($P>0.05$); injecting 90 μg folic acid significantly increased the spleen index of 1-day-old broilers compared with saline group ($P<0.05$), compared with 45 μg folic acid group, injecting saline and 90 μg folic acid significantly increased the index of bursa of Fabricius of 1-day-old broilers ($P<0.05$), and compared with saline group, injecting 45 μg folic acid significantly increased the index of bursa of Fabricius of broilers aged 21 days ($P<0.05$). 3) Injecting folic acid during incubation period had no significant effects on plasma folic acid content of 1-day-old broilers and plasma total protein and albumin contents of broilers aged 1, 21 and 42 days ($P>0.05$), and compared with saline group and 90 μg folic acid group, injecting 45 μg folic acid significantly increased plasma globulin content of 1-day-old broilers ($P<0.05$). 4) Injecting folic acid during

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Incubation period had no significant effects on the activities of total superoxide dismutase (T-SOD) and glutathione peroxidase (GSH-Px), and malondialdehyde (MDA) content in liver of 1-day-old broilers ($P>0.05$). 5) Injecting folic acid during incubation period had no significant effects on the CD4⁺ percentage and CD4⁺/CD8⁺ in blood of broilers aged 28 days, and the percentages of CD4⁺ and CD8⁺ and CD4⁺/CD8⁺ in blood of broilers aged 40 days ($P>0.05$); while injecting 45 μg folic acid significantly decreased the CD8⁺ percentage in blood of broilers aged 28 days compared with saline group ($P<0.05$). Based on the results of the experiment, it is concluded that injecting folic acid to egg at 11 embryonic ages during incubation period can improve the performance of broilers.

Keywords: [folic acid](#), [performance](#), [immune function](#), [broilers](#)

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