

In Ovo Injection of N-Carbamylglutamate Improves Growth Performance, Muscle Fiber Development, and Meat Quality in Broiler Chickens

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Abstract : N-carbamylglutamate (NCG) has emerged as a promising candidate for regulating endogenous arginine synthesis, thereby promoting desirable growth, carcass traits, and muscle development in broilers. Thus, this study aimed to investigate the effects of NCG in ovo feeding on the growth performance, growth hormones, and meat quality of Ross 308 breeder broilers. A total of 1680 embryo eggs were equally allocated into three treatment groups: non punctured control (NC), saline-injected control (SC; 100 μ L/egg), and N-carbamylglutamate injected group (NCG; 2 mg/egg). The treatment solution was injected into the amniotic cavity of the embryo at 17.5 days of incubation (DOI). For the subsequent 42 days of post hatch experimental sampling, a total of 360 broiler chicks with 6 replications per treatment and 15 chicks per replication were used. Chickens in the NCG group showed significantly higher ($P<0.05$) body weight gain (BWG) and final body weight (FBW) at both 21 and 42 days after hatch (DAH), while feed conversion efficiency (FCE) was significantly improved ($P<0.05$) at 42 DAH. The weight and percentage of drums at 21 DAH and the weight and percentage of breast muscle at 42 DAH were significantly higher ($P<0.05$) in the NCG group. In addition, insulin (INS), growth hormone (GH), and testosterone (T) levels were significantly higher ($P<0.05$) in the NCG groups at 21 and 42 DAH. Furthermore, triiodothyronine (T3) and tetraiodothyronine (T4) levels were significantly higher ($P<0.05$) in the NCG treatment group. Interestingly, meat color values were also significantly higher ($P<0.05$) in the NCG group at 24 hrs postmortem. Collectively, these findings show that 2 mg NCG in ovo injection improves the growth performance and meat quality of broilers; even the effects extend into the market age of the chickens.

Keywords : N-carbamylglutamate, broiler, in ovo injection, growth performance, meat quality

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