

عنوان مقاله:

Method of Production and Assessment of an Encapsulated Choline Chloride and Its Effects on Growth Performanc
and Serum Lipid Indices in Broilers

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خلاصه مقاله:

Since, choline chloride caking causes serious operating difficulties and customer complaints, two experiments were conducted to optimize in vitro production of a novel encapsulated choline chloride (ECC) with minimum hygroscopic property and optimize delivery in gastrointestinal tract (GIT). The in vivo verification test of ECC was used to compare it with the commercial choline chloride (CC) in Ross 308 broiler chickens. Twelve factors with 3 levels including 27 formulations on ECC properties were evaluated using the Taguchi method (signal/noise ratio analysis). The produced ECC particles showed a decrease in hygroscopic property and release rate under simulated GIT. The in vitro study showed that the encapsulation efficiency of 27 formulations were $\geq 80\%$ and choline content in ECC particles ranged from 507 to 718 g/kg (wt/wt). The oil, wax, whey protein concentrate (WPC), and calcium stearate contents had the most influence on hygroscopic property ($P < 0.05$). The ECC particle gastric resistance was improved by increasing oil and wax contents as well as sonication time, pH, and carrier content ($P < 0.05$). Average daily gain of broiler chickens fed diet supplemented with choline chloride (CC or ECC) was increased compared to those fed negative control diet during starter period ($P < 0.05$). The serum concentration of low-density lipoprotein-cholesterol, triglyceride, and cholesterol were decreased in birds fed diet supplemented with choline chloride (CC or ECC; $P < 0.05$). The results showed that ECC with no hygroscopic property might be an alternative to CC without negative effect on performance of broiler chickens.

کلمات کلیدی:

Broiler, Flow ability, Encapsulation, Taguchi method, Choline chloride

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