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Comparison of the Effect of Nano Calcium Carbonate and $CaCO_3$ on Egg Production, Egg Traits and Calcium Retention in Laying Japanese Quail

Authors : Farhad Ahmadi, Hammed Kimiaee

Abstract : Context: This research study focuses on the effect of different levels and sources of calcium on egg production, egg traits, and calcium retention in laying Japanese quail. The study aims to determine the impact of nano calcium carbonate (NCC) and calcium carbonate (CC) on these factors. Research Aim: The main objective of this research is to investigate the effect of different levels and sources of calcium on egg production, egg traits, and calcium retention in laying Japanese quail. Specifically, the study aims to compare the effects of NCC and CC on these parameters. Methodology: The research was conducted using a total of 280 laying quail with an average age of 8 weeks. The quails were randomly distributed in a completely randomized design (CRD) with 7 treatments, 4 replications, and 10 quails in each pen. The study lasted for 90 days. The experimental diets included a control group (T1) with a basal diet consisting of 3.17% $CaCO_3$, and other groups supplemented with different levels (0.5%, 0.1%, and 0.15%) of either calcium carbonate (CC) or nano calcium carbonate (NCC). The quails had free access to water and feed throughout the study period. Findings: The results of the study showed that NCC at the levels of 0.1% and 0.15% (T6 and T7) improved eggshell thickness, shell thickness, and shell breaking strength compared to the control group. Although not statistically significant, there was an increasing trend in quail egg production and calcium retention in the calcareous shell of the egg in birds that consumed the experimental diets containing different levels of NCC compared to the control and other treatment groups. Theoretical Importance: This research contributes to our understanding of the effect of NCC and CC on egg production, egg traits, and calcium retention in laying Japanese quail. It highlights the potential benefits of using NCC as a calcium source in quail diets, specifically in improving the quantity and quality of eggs and calcium retention. Data Collection and Analysis Procedures: Quail egg production was recorded monthly for each treatment group. At the end of the study, a total of 40 eggs (10 eggs/replicate) from each treatment group were randomly selected for analysis. Parameters such as eggshell thickness, shell thickness, shell breaking strength, and calcium retention were measured. Statistical analysis was performed to compare the results between the different treatment groups. Questions Addressed: This research aimed to answer the following questions: What is the effect of different levels and sources of calcium on egg production, egg traits, and calcium retention in laying Japanese quail? How does nano calcium carbonate compare to calcium carbonate in terms of these parameters? Conclusion: In conclusion, this study suggests that NCC at the levels of 0.1% and 0.15% can improve the quantity and quality of eggs and calcium retention in laying Japanese quail. These findings highlight the potential benefits of using NCC as a calcium source in quail diets. Further research could be conducted to explore the mechanisms behind these improvements and optimize the dosage of NCC for maximum effect.

Keywords : egg, calcium, nanoparticles, retention
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