



## Physiological and Hepatic Responses of Broiler Chickens to Graded Levels of Dietary Dried Orange Pulp

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### Abstract

Due to the rapid growth rate and intensive feeding systems in modern poultry production, the liver is particularly susceptible to metabolic and pathological alterations. This study aimed to evaluate the effects of dietary incorporation of dried orange pulp (DOP) on physiological responses in broiler chickens, with particular emphasis on hepatic health. The assessment was based on selected blood biochemical parameters, including glucose, total proteins, triglycerides, cholesterol, aspartate aminotransferase (AST), alanine aminotransferase (ALT), lactate dehydrogenase (LDH), and creatine kinase (CK), which reflect metabolic status and liver function under nutritional and physiological stress conditions.

A total of 200 one-day-old Arbor Acres broiler chickens ( $45 \pm 1.7$  g) were randomly allocated into four dietary groups, each consisting of 50 birds with five replicates of 10 birds, and reared for 49 days. The dietary treatments included a control diet without DOP and three experimental diets in which corn was partially replaced with DOP at inclusion levels of 5%, 10%, and 15%. Blood samples were collected at 49 days of age for biochemical analysis.

Results indicated that dietary DOP significantly affected serum biochemical parameters ( $p < 0.05$ ). Birds fed DOP diets exhibited significantly reduced triglycerides and total cholesterol compared to the control group. Glucose and total protein levels increased significantly with increasing DOP inclusion, particularly at 15%. Moreover, AST and ALT activities were significantly lower in DOP-supplemented groups, with the most marked improvement observed at the 10% inclusion level. Similarly, LDH and CK activities were significantly reduced in the 10% DOP group, indicating improved metabolic efficiency and hepatic status.

Overall, dietary DOP positively modulated the serum biochemical profile of broiler chickens, with 10% inclusion yielding the most favorable effects. These results suggest improved liver function, enhanced metabolic stability, and better physiological welfare under intensive rearing conditions.

**Keywords:** Dried orange pulp, aspartate aminotransferase, alanine aminotransferase, lactate dehydrogenase, and creatine kinase.

