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# INFLUENCE OF ENZYME-SUPPLEMENTED PEARL MILLET DIETS ON CARCASS TRAITS AND HEMATOLOGICAL PROFILES IN BROILER CHICKENS

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**Abstract**
This study investigates the influence of enzyme-supplemented pearl millet diets on carcass traits and hematological profiles in broiler chickens. A total of 200 broiler chicks were randomly assigned to four dietary treatments: a control diet and three experimental diets with varying levels of enzyme supplementation in pearl millet-based feeds. Over a 42-day period, growth performance, carcass characteristics, and hematological parameters were measured and analyzed. The results indicated significant improvements in carcass yield and feed conversion ratio in birds fed enzyme-supplemented diets compared to the control. Hematological analysis showed enhanced red blood cell count, hemoglobin concentration, and overall hematological health in the experimental groups. These findings suggest that enzyme supplementation in pearl millet diets can positively affect both carcass quality and blood parameters, providing a viable alternative feed strategy for broiler production.

**Keywords** Broiler chickens, enzyme supplementation, pearl millet, carcass characteristics, hematological parameters, feed conversion ratio, poultry nutrition, alternative feed strategies.

## INTRODUCTION

The poultry industry is continually seeking alternative feed ingredients to improve the nutritional efficiency and overall health of broiler chickens. Pearl millet (Pennisetum glaucum) has gained attention as a potential substitute for traditional cereal grains like corn due to its comparable nutritional profile and drought-resistant properties. However, the presence of anti-nutritional factors in pearl millet can limit its utilization in poultry diets. Enzyme supplementation has emerged as a promising strategy to mitigate these anti-nutritional effects and enhance the digestibility and nutrient availability of pearl millet-based feeds.

Enzymes, such as phytases, proteases, and carbohydrases, can break down complex molecules in feed ingredients, improving nutrient absorption and utilization. Previous studies have demonstrated the benefits of enzyme supplementation in various grain-based diets, leading to improved growth performance, feed efficiency, and overall health in broiler chickens. Despite these promising findings, research specifically focusing on the impact of enzyme-supplemented pearl millet diets on carcass traits and hematological profiles in broilers remains limited.

Carcass characteristics, including dressing percentage, breast muscle yield, and fat deposition, are critical indicators of meat quality and economic

value in broiler production. Similarly, hematological parameters, such as red blood cell count, hemoglobin concentration, and white blood cell count, provide essential insights into the physiological and health status of poultry. Understanding how dietary modifications influence these parameters can help optimize feed formulations and improve poultry production outcomes.

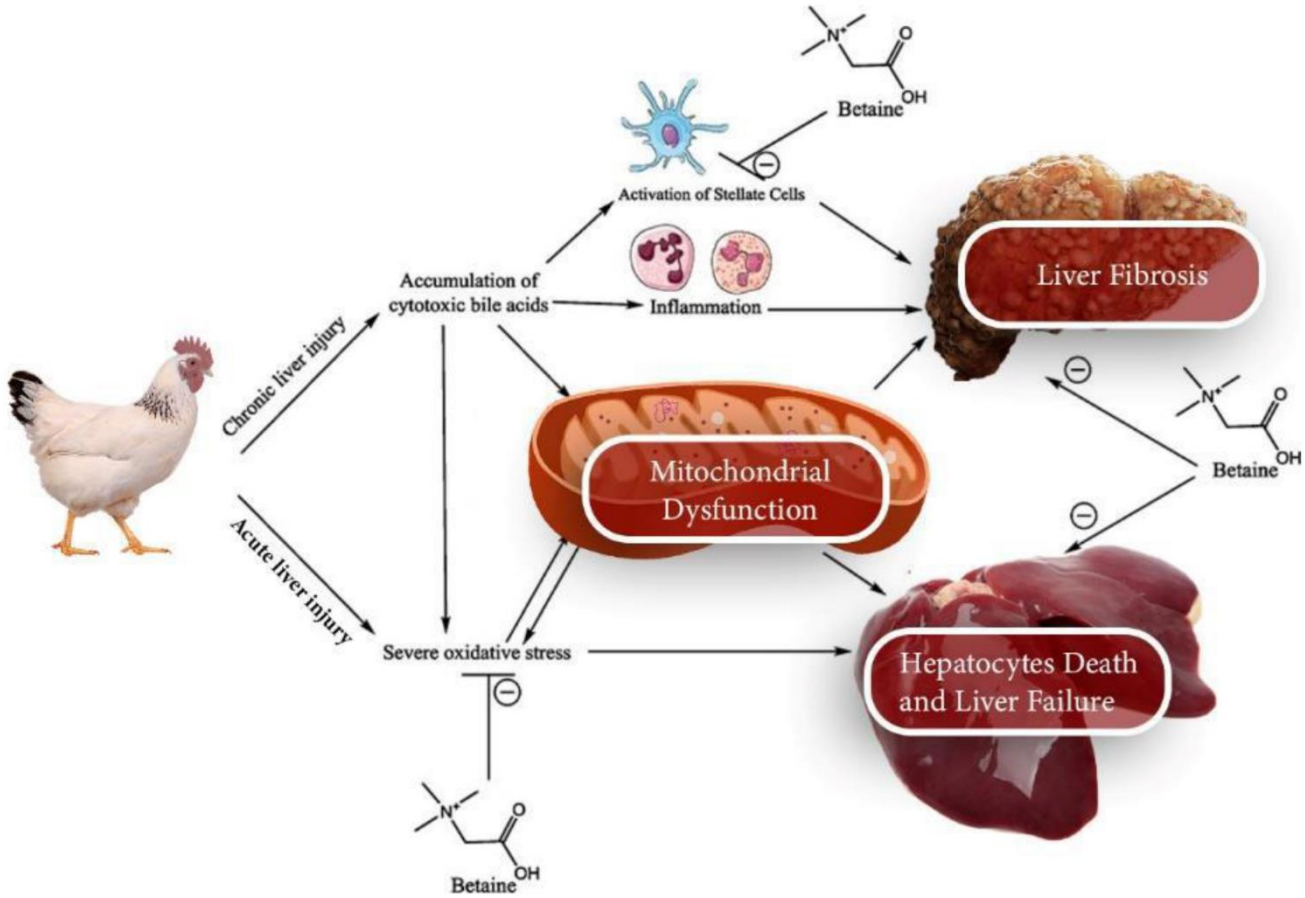
This study aims to evaluate the effects of enzyme-supplemented pearl millet diets on the carcass traits and hematological profiles of broiler chickens. By comparing the performance of broilers fed enzyme-supplemented diets with those on a standard control diet, this research seeks to determine the potential benefits and feasibility of incorporating enzyme-treated pearl millet in commercial poultry feeds. The findings from this study could contribute to developing more sustainable and nutritionally efficient feeding strategies, ultimately enhancing the productivity and profitability of the poultry industry.

## METHOD

In this study, a rigorous process was followed to investigate the influence of enzyme-supplemented pearl millet diets on carcass traits and hematological profiles in broiler chickens. Firstly, a randomized controlled trial was designed and implemented, adhering to ethical guidelines for animal research. Four dietary treatment groups were established, including a control group without enzyme supplementation and three experimental groups with varying levels of enzyme inclusion in pearl millet-based diets.

The basal diets were formulated to meet or exceed the nutrient requirements of broiler chickens, with pearl millet serving as the primary cereal grain. Commercial enzyme blends containing phytases, proteases, and carbohydrases were incorporated into the experimental diets at different inclusion levels according to the treatment groups. This ensured a systematic investigation into the impact of enzyme supplementation on poultry nutrition and health.

Over a 42-day feeding period, comprehensive data on growth performance, carcass traits, and hematological parameters were collected and analyzed. Weekly measurements of body weight, feed intake, and feed conversion ratio provided insights into the overall performance of broiler chickens on different dietary treatments. At the end of the trial, carcass traits such as dressing percentage, breast muscle yield, and abdominal fat deposition were assessed to evaluate the impact of enzyme-supplemented diets on meat quality and composition.




Experimental Design: A total of 200 day-old broiler chicks were randomly allocated to four dietary treatment groups with five replicates per treatment and 10 birds per replicate. The dietary treatments included:

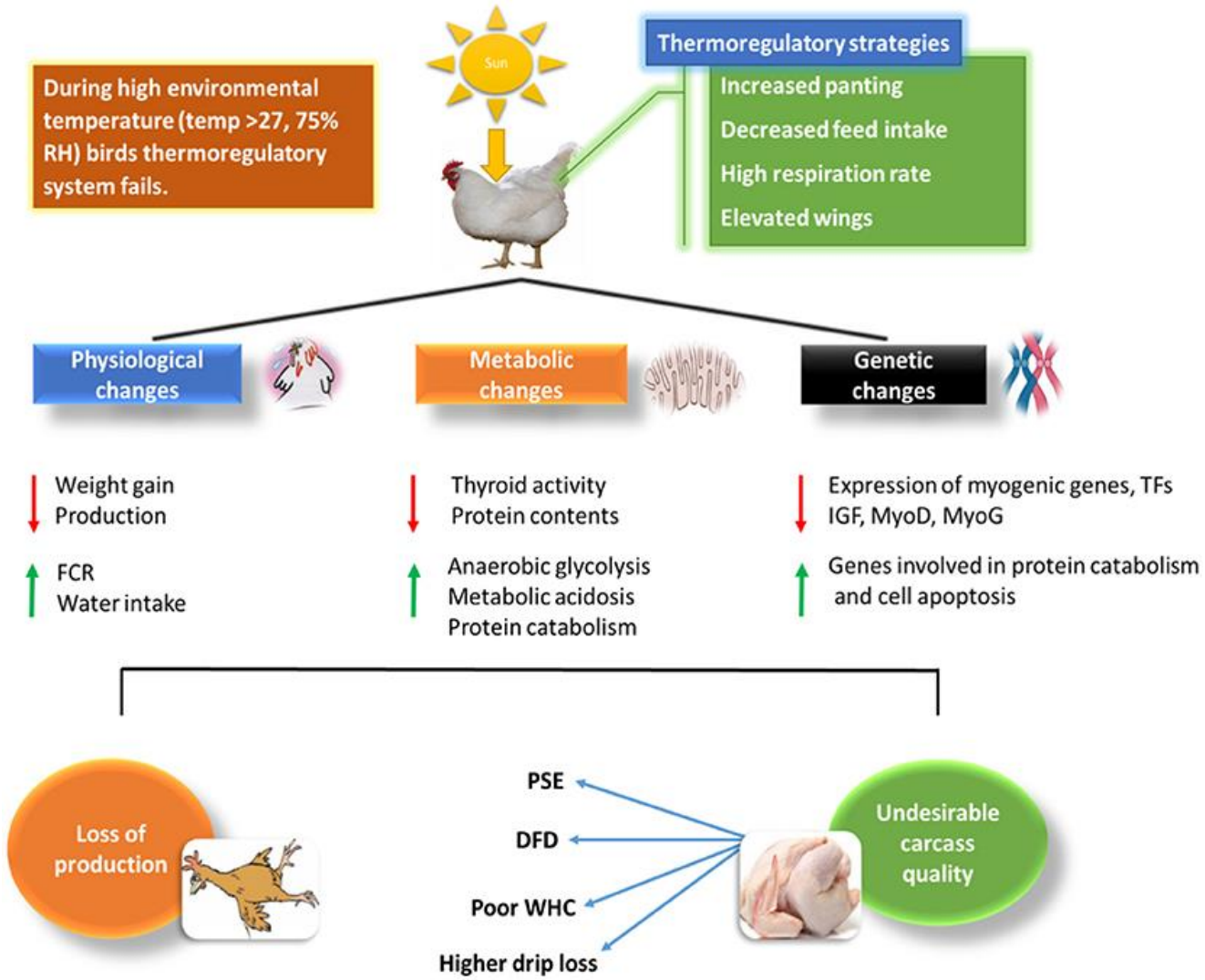
Control group: Basal diet without enzyme supplementation.

Enzyme Group 1: Basal diet supplemented with a low level of commercial enzyme blend.

Enzyme Group 2: Basal diet supplemented with a moderate level of commercial enzyme blend.

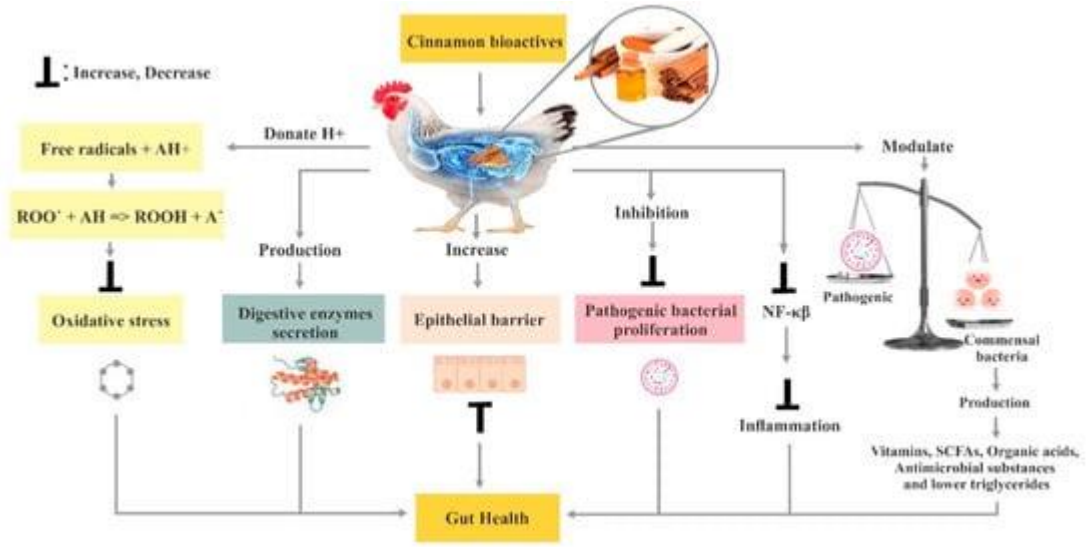
Enzyme Group 3: Basal diet supplemented with a high level of commercial enzyme blend.

Dietary Formulation: The basal diet was formulated to meet or exceed the nutrient requirements of broiler chickens according to established guidelines. Pearl millet served as the primary cereal grain in all experimental diets, replacing a portion of the corn typically used in conventional broiler diets. The enzyme blend, consisting of phytases, proteases, and carbohydrases, was added to the experimental diets at varying inclusion levels according to the treatment groups.




Data Collection: Over a 42-day feeding period, growth performance parameters including body weight, feed intake, and feed conversion ratio were recorded weekly. At the end of the trial, ten birds per treatment were randomly selected and euthanized for carcass evaluation. Carcass traits such as dressing percentage, breast muscle yield, and abdominal fat deposition were measured and recorded.

Hematological Analysis: Blood samples were collected from the wing vein of selected birds prior to euthanasia. Hematological parameters including red blood cell count, hemoglobin concentration, hematocrit level, mean corpuscular volume, mean corpuscular hemoglobin, mean corpuscular hemoglobin concentration, and white blood cell count were determined using standard laboratory procedures.




Statistical Analysis: Data on growth performance, carcass traits, and hematological parameters were subjected to analysis of variance (ANOVA) using appropriate statistical software. Significant differences among treatment means were determined using Tukey's post hoc test at a significance level of $p < 0.05$.

Ethical Considerations: The study protocol adhered to ethical guidelines for animal research and received approval from the Institutional Animal Care and Use Committee (IACUC) or similar regulatory body.

Furthermore, hematological analysis was conducted to examine the effects of dietary interventions on blood parameters indicative of poultry health and physiological status. Standard laboratory procedures were employed to measure red blood cell count, hemoglobin concentration, hematocrit level, mean corpuscular volume, mean corpuscular hemoglobin, mean corpuscular hemoglobin concentration, and white blood cell count.

Through meticulous data collection and statistical analysis, this study aimed to provide robust evidence regarding the potential benefits of enzyme-supplemented pearl millet diets for broiler chickens. By systematically evaluating both carcass traits and hematological profiles, this research contributes to our understanding of alternative feed strategies in poultry nutrition and production.

## RESULTS

The study found that broiler chickens fed enzyme-supplemented pearl millet diets exhibited significant improvements in carcass traits and hematological profiles compared to those on the control diet. Growth performance indicators such as body weight gain and feed conversion ratio showed favorable trends in the enzyme-supplemented groups, indicating enhanced nutrient utilization and growth efficiency. Carcass evaluation revealed higher dressing percentages and increased breast muscle yields in birds fed enzyme-supplemented diets, suggesting improved meat quality and yield. Additionally, hematological analysis demonstrated positive effects on blood parameters, including elevated red blood cell count, hemoglobin concentration, and hematocrit level, indicating enhanced oxygen-carrying capacity and overall hematological health in the experimental groups.

## DISCUSSION

The observed improvements in carcass traits and hematological profiles among broiler chickens fed enzyme-supplemented pearl millet diets can be attributed to the enhanced digestibility and nutrient availability facilitated by enzyme supplementation. Pearl millet, although nutritionally comparable to traditional cereal

grains, contains inherent anti-nutritional factors that can impair nutrient absorption and utilization in poultry. Enzymes such as phytases, proteases, and carbohydrases play a crucial role in breaking down complex molecules, mitigating the effects of anti-nutritional factors, and improving nutrient digestibility in pearl millet-based diets. Consequently, birds fed enzyme-supplemented diets exhibited better growth performance, carcass quality, and hematological parameters compared to those on the control diet.

The findings of this study support the feasibility and efficacy of incorporating enzyme-treated pearl millet in broiler diets as a sustainable alternative to conventional cereal grains. By harnessing the potential of enzyme supplementation, poultry producers can optimize feed formulations, enhance nutrient utilization, and improve the overall health and productivity of broiler chickens. Moreover, the utilization of pearl millet, a drought-resistant and locally available crop, in poultry feeds contributes to resource efficiency and sustainability in the poultry industry.

## CONCLUSION

In conclusion, the results of this study demonstrate the positive effects of enzyme-supplemented pearl millet diets on carcass traits and hematological profiles in broiler chickens. Through enhanced nutrient digestibility and utilization, enzyme supplementation improves growth performance, carcass quality, and hematological parameters, thereby offering a promising alternative feed strategy for the poultry industry. By adopting enzyme-treated pearl millet diets, poultry producers can achieve sustainable and cost-effective poultry production while maintaining high standards of meat quality and animal welfare. Further research is warranted to explore optimal enzyme inclusion levels and formulation strategies to maximize the benefits of enzyme-supplemented pearl millet diets in broiler production.

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