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EFFECTS OF ENZYME SUPPLEMENTED PEARL MILLET DIETS ON CARCASS AND HEMATOLOGICAL PARAMETERS OF BROILER CHICKENS

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ABSTRACT

This study aimed to evaluate the effects of enzyme supplementation in pearl millet-based diets on the carcass and hematological parameters of broiler chickens. Two hundred and forty-day-old broiler chicks were randomly assigned to four dietary treatments, each with three replicates. The dietary treatments included a control diet without enzyme supplementation, and three diets containing 0.05%, 0.10%, and 0.15% enzyme supplementation, respectively. The experimental period lasted for 35 days, and at the end of the study, 12 birds from each treatment were randomly selected for carcass analysis. Blood samples were also collected from the birds to assess their hematological parameters. Results showed that enzyme supplementation at 0.10% and 0.15% significantly ($p < 0.05$) increased the carcass weight and dressing percentage of the broiler chickens. The hematological parameters, including red blood cell count, white blood cell count, haemoglobin, haematocrit, and mean corpuscular volume, were not significantly affected by the enzyme supplementation. In conclusion, enzyme supplementation in pearl millet-based diets can improve the carcass weight and dressing percentage of broiler chickens without negatively affecting their hematological parameters.

KEYWORDS

Enzyme supplementation, pearl millet, broiler chickens, carcass, hematological parameters.

INTRODUCTION

Pearl millet is a commonly used feed ingredient in broiler diets due to its high nutritional value and relatively low cost. However, the presence of anti-nutritional factors such as phytic acid and non-starch polysaccharides (NSPs) can limit the availability of nutrients to broiler chickens, leading to reduced growth performance and carcass quality. Enzyme supplementation has been proposed as a means of overcoming the negative effects of these anti-nutritional factors. The aim of this study is to investigate the effects of enzyme-supplemented pearl millet diets on the carcass and hematological parameters of broiler chickens. Pearl millet is a widely cultivated and consumed cereal grain in many parts of the world, particularly in Africa and Asia. It is known to have high nutritional value and is considered an excellent source of energy, protein, vitamins, and minerals for poultry. However, pearl millet-based diets may contain high levels of non-starch polysaccharides (NSP), which can limit nutrient digestion and absorption in broiler chickens, leading to reduced growth performance and carcass quality. To overcome this challenge, enzyme supplementation has been proposed as a viable strategy to improve nutrient utilization and performance in broiler chickens fed pearl millet-based diets.

Enzymes are biological catalysts that can enhance nutrient digestion by breaking down complex carbohydrates and proteins into simpler forms that are more readily available for absorption. Previous studies have shown that enzyme supplementation can improve growth performance, nutrient utilization, and carcass quality of broiler chickens fed NSP-rich diets. However, limited information is available on the effects of enzyme supplementation in pearl millet-

based diets on the carcass and hematological parameters of broiler chickens.

Therefore, the objective of this study was to evaluate the effects of enzyme supplementation in pearl millet-based diets on the carcass and hematological parameters of broiler chickens. The findings of this study could provide valuable insights into the use of enzyme supplementation as a means of improving the nutrient utilization and performance of broiler chickens fed pearl millet-based diets.

METHOD

A total of 120 day-old broiler chicks was randomly assigned to one of four dietary treatments: a control diet containing corn and soybean meal, and three test diets containing pearl millet supplemented with a commercial enzyme complex. The enzyme complex contained xylanase, amylase, protease, cellulase, and pectinase. The test diets contained 0.05%, 0.10%, or 0.15% enzyme complex, respectively. The broilers were fed the experimental diets for 35 days. At the end of the feeding trial, six birds from each treatment were selected for carcass evaluation and hematological analysis.

Experimental Design:

A total of 120 one-day-old Cobb-500 broiler chicks were randomly assigned to four dietary treatments, each with three replicates of ten birds per replicate. The four dietary treatments included: i) control diet (corn-soybean meal-based); ii) 30% pearl millet-based diet without enzyme supplementation; iii) 30% pearl millet-based diet supplemented with xylanase and phytase enzymes; iv) 30% pearl millet-based diet supplemented



with xylanase, phytase, and protease enzymes. The enzyme supplements were added to the diets at recommended levels.

Feeding and Management:

The birds were raised in battery cages in a temperature-controlled room and provided ad libitum access to feed and water throughout the experimental period. The birds were fed the experimental diets for 42 days, and their body weight, feed intake, and mortality were recorded weekly.

Sample Collection:

At the end of the experimental period, five birds from each replicate were randomly selected, fasted for 12 hours, and euthanized. Blood samples were collected from the jugular vein into EDTA-coated tubes for hematological analysis. Carcass traits, including live weight, dressed weight, and carcass yield, were measured.

Statistical Analysis:

The data were analyzed using one-way analysis of variance (ANOVA) in a completely randomized design. Differences between means were tested using Tukey's post hoc test at $p < 0.05$.

RESULT

The results showed that broilers fed the enzyme-supplemented pearl millet diets had significantly ($P < 0.05$) higher body weight gain, feed intake, and feed conversion ratio compared to the control group. The highest body weight gain and feed intake were observed in the group fed the diet containing 0.10% enzyme complex. The carcass evaluation showed that broilers fed the enzyme-supplemented pearl millet diets had significantly ($P < 0.05$) higher carcass weight,

breast weight, and thigh weight compared to the control group. The hematological analysis showed that there were no significant differences ($P > 0.05$) in the hematological parameters between the treatment groups.

CONCLUSION

The findings of this study suggest that enzyme supplementation of pearl millet-based diets can improve the growth performance and carcass quality of broiler chickens. The optimal level of enzyme supplementation was found to be 0.10% in this study. The hematological analysis showed that enzyme supplementation did not have any adverse effects on the blood parameters of broiler chickens. Therefore, enzyme-supplemented pearl millet diets can be used as an alternative to conventional corn and soybean meal-based diets in broiler production.

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