

***DEDICATION***

TO

The souls of my late parents: mother Fatima and Father Hamed Elneel may  
their souls rest in Allah's merciful

TO

My husband Aktham and our beloved daughters Noon and Palsam  
TO  
My brothers and sisters

## **Table of contents**

**Content**

**Page**

**Dedication** **1**

**Table of contents**

**List of tables**

**Acknowledgement**

**Arabic Abstract**

**1.0 Introduction**

**2.0 Literature Review**

**2.1 Enzymes**

**2.2.1 Non-starch poly saccharides enzymes:-**

**2.2.2 Phytase**

**Enzymes as growth promoters**

**2.5.1 Effect of Enzyme Supplementation on broiler performance**

**dry matter digestibility and carcass quality**

**3.0 Materials and Methods**

**3.1 Materials:-**

**3.1.1 Experimental site, housing and duration:**

**3.1.2 Experimental Birds:-**

**3.1.3 Experimental Diets:-**

**3.2 Methods:**

**3.2.1 Husbandry:**

**3.2.2 Carcass preparation:-**

**3.2.3 Carcass Cuts Preparation:-**

**3.2.4 Sensory Evaluation:**

**3.2.5 Determination of dry matter digestibility:**

**3.2.6 Blood sampling and serum analysis:**

**Content**

**Page**

**3.2.6.1 Glucose determination:**

**3.2.6.2 Protein Determination:**

**3.2.6.3 Phosphorous determination:**

**3.2.6.4 Calcium determination:-**

**3.2.6.5 Glutamic – Pyruvate Transaminase (GPT) determination:-**

**3.2.7 Chemical Analysis:-**

**3.2.8 Experimental Design and Statistical Analysis:-**

**4.0 Results**

**4.1 Broiler Performance**

**4.1.1 Mean weekly feed intake (g/bird):**

**4.1.2 Mean weekly weight gain (g/bird):**

**4.1.3 Mean weekly feed conversion ratio (g feed/g gain):**

**4.1.4 Overall performance results:**

**4.2 Dry matter digestibility:**

**4.3 Dressing percentage, meat relative weight and fat relative weight:**

**4.4 Carcass cuts relative weights:**

**4.5 Internal organ relative weights:**

**4.6 Biochemical profile of blood constituents:**

**5:0 Discussion**

## **6:0 References**

## **Appendixes**

### **List of tables**

#### **T a b l e s**

#### **Page**

- 1:**(A)&(B)Composition and calculated analysis of experimental diets (%):
- 2:**Determined proximate analysis of the experimental starter and finisher diets (percent as fed)
- 3:**Effect of enzymes supplementation and grain source on mean weekly feed intake of broiler chicks (g/bird) .
- 4:**Total nutrient intake throughout starting period (0 – 4 wks)
- 5:**Total nutrient intake throughout starting finishing period
- 6:**Effect of enzymes supplementation and grain source on mean weekly weight gain of broiler chicks (g/bird).
- 7:**Effect of enzymes supplementation and grain source on weekly mean feed conversion ratio of broiler chicks (g feed/g gain).
- 8:**Effect of enzymes supplementation and grain source on overall performance results of 6 weeks old broiler chicks.
- 9:**Effect of enzymes supplementation and grain source on dry matter digestibility of 6 weeks old broiler chicks (%).

**10:**Effect enzymes supplementation and grain source on dressing percentage, meat and fat relative weights (%).

**11:**Effect of enzymes supplementation and grain source on carcass cuts relative weights (%).

**12:**Effect of enzymes supplementation and grain source on internal organs relative weights (%) .

**13:**Effect of enzymes supplementation and grain source on the biochemical profile of the blood constituents of broiler chicks.

## **Acknowledgement**

Thanks to God for giving me fortune, aptitude and patience to conduct this study. I am greatly indebted to my supervisor Dr. Bader Hassab Elrasoul for his keen interest supervision and guidance throughout this study

I wish to express my thanks to the Arab Company for Agricultural, Production and Processing (ACAPP), Poultry Unit, particularly Dr. Omer A/Gadir Omer and the staff of the Poultry Unit for their financial support. Thanks are also extended to College of Veterinary Medicine and Animal Production, specifically Prof. Sayed Ahmmed Elshafei, Prof. Ahmed Ali Ismaeil, Dr. Mohammed Tag Eldien and Dr. Imad Mohammed Tahir to their valuable assistance. I would like to extend my thanks to the Animal Production Department, College of Agricultural studies, Sudan University of Science and Technology (shambat), particularly Dr. Salah Sayed Ahmmed, and the staff in this college for providing housing facilities and equipments and assisting in carrying out the experimental work. I wish to express my thanks to Lana Company for Veterinary Services and the Ministry of Animal Resources, Gadarif State particularly, Dr. Elagip Abosam and Dr. Mohamed Elameen. My appreciation is due to my husband Aktham for his assistance. I am greatly indebted to my family and to my brothers and sisters specially Gafar, Tag Elsir, Imad and Nawal for generous help. Thanks also go to my colleagues Rahama Ali, Basharia A/ Aziem and abd Alla Hassan.

## Abstract

The effect of enzymes supplementation of maize-based and sorghum based broiler diets on the broiler performance, dry matter digestibility some carcass quality parameters and blood constituents were investigated.

A total of 400 one day old broiler chicks were randomly distributed into 4 dietary treatments (maize based diet with enzymes, maize based diet without enzymes, sorghum based diet with enzyme and sorghum based diet without enzymes) in factorial arrangement complete randomized design experiment (100 birds/treatment).

A multi-enzyme system (Optimize) consisted of phytase and non-starch polysaccharides (NSP) enzymes (xylanase and  $\beta$ -Glucanase) used in the broiler diet supplementation with inclusion rate of 1g/kg feed.

Overall performance results showed that the mean live body weight gain (g/bird) for birds fed enzymes supplemented diets was significantly ( $P<0.05$ ) higher compared to unsupplemented diets throughout the experimental period and the final live body weight followed the same pattern of weight gain. The total feed intake (g/bird) for birds fed unsupplemented sorghum based diet was significantly ( $P<0.05$ ) lower compared to other dietary treatments. No significant differences among dietary treatment in feed conversion ratio during the six weeks experimental period, but it tended to improve for birds kept on enzymes supplemented maize-based diets.

The statistical analysis of the main effects showed that that the significant ( $P<0.05$ ) improvement in total weight gain and final live body weight was due to enzymes supplementation rather than the grain source. Also it can be seen that the enzymes supplementation caused a significant ( $P<0.05$ ) increased in total feed intake (g/bird).

Dry matter digestibility tended to improve for birds fed maize based diet supplemented with enzymes; however this improvement is statistically insignificant.

Dressing percentage of birds fed enzymes supplemented diets was significantly ( $P<0.05$ ) higher compared to those birds kept on unsupplemented diets. Meat and fat relative weights showed no significant differences.

Carcass cuts relative weights showed no significant difference but it tended to be higher for birds fed enzymes supplemented diets for both grains.

Internal organ (liver, pancreas and spleen) relative weights showed no significant differences but it tended to be lower for birds fed unsupplemented sorghum diets.

Blood glucose, protein, phosphorus, calcium glutamate oxaloacetate transaminase (GOT) and glutamate pyruvate transaminase (GPT) levels were significantly ( $P < 0.05$ ) affected by the dietary treatments. All these blood constituents except blood calcium were significantly ( $P < 0.05$ ) affected by the enzymes supplemented while blood calcium was affected by the grain source.

Sensory evaluation results showed no significant differences, but the yellowness degree of carcass of birds kept on maize-based diets tended to be higher.



## **Arabic Abstract**