FINAL YEAR DISSERTATION RESEARCH REPORT

EVALUATION OF GROWTH PERFORMANCE OF WISTAR RATS FED ON AN ENZYMATICALLY DETOXIFIED AFLATOXIN B1 MAIZE DIET.

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THIS FINAL YEAR RESEARCH DISSERTATION IS SUBMITTED TO THE DEPARTMENT OF ANIMAL PRODUCTION AND MANAGEMENT IN PARTIAL FULFILMENT FOR THE AWARD OF A DEGREE OF BACHELOR OF ANIMAL PRODUCTION AND MANAGEMENT.

DECLARATION

I declare that the information in this research dissertation was done by me and it has never been submitted to any institution for academic ward.

NAMATAKA PENINAH

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APPROVAL

ACADEMIC SUPERVISOR

MR. MUYINDA ROBERT

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Date.....21/03/2024

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DEDICATION

I dedicate this research desertion to the Aflatoxin project, Mr. Muyinda Robert and Dr. Zirintunda Gerald, my family and friends for the great support towards this research to see it come to accomplishment. may the good lord bless you.

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LIST OF ABBREVIATIONS

AFB1-:	Aflatoxin B1
AFM1-:	Aflatoxin M1
AFQ1-:	Aflatoxin Q1
AFP1-:	Aflatoxin P1
DMP-:	2,6-dimethoxyphenol
ABTS-:	2,2'-azinobis
COVAB: -	Collage of Veterinary Medicine, Animal Resources and Bio-security
µ: -	micro
n: -	nano
L: -	liter
A.F: -	Aflatoxin
g: -	grams
mls: -	milliliters
S.I: -	international system of units.
M.F I: -	mean feed intake
M.F.C.R: -	mean feed conversion ratio
Hrs.: -	hours

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ABSTRACT

This research was aimed at evaluating the growth performance of wistar rats fed on enzymatically detoxified aflatoxin B1 maize diet.

In vivo research was carried on 20 male wistar rats, grouped into groups of five rats per cage for six weeks and fed on maize diet enzymatically detoxified at different time intervals of 0,4,12,24 hours, growth performance was determined using the parameters such as feed intake, weight gain and feed conversion ratio.

Results; mean feed intake of the control and treatment groups, Week 1 and week 4 was significatively different for the treatment and control groups with p values of 0.004 and 0.007 respectively. Week 2,3, and 5 had no significant difference among the treatment and control the groups with p values of 0.06, 0.19, 0.12 respectively that where greater than the 5%. In week one, group D had the highest feed intake of 0.027, followed group B 0.024, group C 0.023 and group A 0. 017.In week two, group D 0.027, group B 0.024, group A 0.023, group C 0.022. In week three group D 0.024 group B 0.018, group C 0.017, group A 0.016. In week four, group D 0.023, group B 0.023, group C 0.018 and group A 0.016. In week five group D 0.021, B 0.019, group C and A group with 0.017. The mean weight gain of the control and treatment groups had no significant difference in all the five weeks of research with P values of 0.959, 0.994, 0.951, 0.821, 0.960 respectively. In week one A group had the highest mean weight gain of 0.068, group B 0.062, group C 0.059 and group D 0. 057.In week two, group B 0.062, group D 0.059 and group C and group A had 0.058. In week three group D 0.059, group C with 0.0585, group B 0.058 and A group 0.052. In week four, group D and B 0.059 and group C and A 0.052. In week five group D 0.058, group B 0.057, and group C had 0.057 and group A had 0. 049.

Findings of the study identified that, a group of rats fed on enzymatically detoxified AFB1 maize diet for 24hrs increased on the feed intake and weight gain growth, thus improving growth performance. Therefore, degradation of AFB1 contaminated maize by ligninolytic enzymes from spent mushroom substrate for time interval of 24hours is safe and effective.

Since this research was carried out on male wistar rats, I recommend a further study on the effect of enzymatically detoxified AFB1 maize diet on growth performance in other animal species.

CHAPTER ONE

1.1.0 Introduction

Globally aflatoxins are a worldwide health threat in both human and animals,(Mousavi Khaneghah et al., 2018), this affects maize quality along the production and consumption chain (Jallow et al., 2021) hence resulting into reduced consumption of maize as discovered in a research carried out among one population of China(F. Wu, 2015).Asia and Sub- Saharan- Africa

Maize contributes 63% to the world's feed industry (Kaul *et al.,* 2019). It is used as whole maize or processed into maize bran in livestock and poultry, and also maize flour for human consumption (Malhotra, 2017). The quality of maize feeds is lowered by AFB1 which are low- weight metabolites produced by Aspergillus *flavus* and *parasiticus*, that naturally contaminate feeds (Scarpari *et al.,* 2014). Aflatoxin contamination is as a result of; Poor storage methods, plant stress in the field, and environmental factors such as high humidity which favors formation of the toxic molds (Negash, 2018). Aflatoxicosis results in a number of health problems such as liver cancer, reduction in weight gain ,declining production in milk, and eggs, poor sperm quality in bulls, birds become prone to diseases, failure of vaccines (Godswill Awuchi *et al*., 2020).These effects result into loses incurred during the production process(Frank, Matthew G. annis, Watkins, 2019)

Aflatoxicosis occurrence has remained high and prevalent due to condition such as hot and humid temperatures (Benkerroum, 2020b).In Uganda increasing aflatoxin contamination among the feed and animal products is because of limited awareness of farmers about the toxin molecule and the recommended toxin limit (Nakavuma et al., 2020).

Studies have shown, many approaches such as chemical, physical and biological have been used to detoxify aflatoxins, which requires the changing of the structure of the toxin molecule (Guo *et al.,* 2021) (Branà *et al.,* 2017) .most of this methods have shown a positive effect in detoxification of AFB1 but their use is practically limited due to safety concern, and loss of nutrients in the commodity, less knowledge on the toxicity of the feed (Karlovsky *et al.,* 2016). Enzymatically detoxified Aflatoxin B1 maize diet on liver function in wistar rats have been approved but have limited use (Tripathi & Mishra, 2009).In this study, evaluation of growth performance and feed intake of wistar rats fed enzymatically detoxified aflatoxin B1 maize diet was carried out.

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