

EFFECT OF YEAST (*Saccharomyces Cerevisiae*) SUPPLEMENTATION ON THE GROWTH PERFORMANCE AND HAEMATOLOGICAL PARAMETERS OF BROILER CHICKEN

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Abstract

An experiment was conducted for 56 days to evaluate the effect of yeast (*Saccharomyces cerevisiae*) supplementation on the growth performance and haematological parameters of broiler chicken. The yeast was incorporated into the experimental diets at varying levels; 0, 1.5, 2.0, 2.5 and 3.0% respectively to formulate five dietary treatments. A total number of one hundred and sixty five (165) unsexed day old Cobb® 500 broiler chicks were randomly allotted into five (5) dietary treatment groups. Each treatment group consisted of three (3) replicates of eleven (11) birds per replicate. Data were collected on the growth performance and haematological parameters of the broiler chickens. Results showed that the yeast supplemented diet significantly ($P < 0.05$) influenced growth performance of the experimental birds. Birds fed 3.0% yeast supplemented diet recorded the highest total weight gain (2044.80 g/b) and the best feed conversion ratio (1.94). Significant differences ($P < 0.05$) among treatments were observed on all the haematological parameters except the mean corpuscular haemoglobin, mean corpuscular volume, lymphocyte, haemoglobin and red blood cells. Values obtained in this study fell within the normal range recommended for healthy broiler chickens. It can therefore be concluded that yeast can be supplemented up to 3.0% in the diets of broiler chicken without any detrimental effect on the performance and the health status of broiler chicken.

Keywords: Yeast (*Saccharomyces Cerevisiae*), Growth Performance and Haematological Parameters

Introduction

For a long time, yeast in form of yeast fermented mash produced on farm and yeast by-product from breweries, distillers or commercial yeast product have been successfully included in feed as natural growth promoters for animals (Saied *et al.*, 2011). Yeast is considered as one of the living micro-organism that when administered through digestive tract has a positive impact on broiler health through its nutritional effects (Patterson and Buckholder, 2003). It boosts immune level resulting in a better protection against infection (Panda *et al.*, 2000). Yeast is a performance enhancer through improvement in protein utilization and significant retention of crude fibre, and degradation of fibrous materials in poultry feeds. Some studies have confirmed that the effects of yeast culture could be an alternative to antibiotics in feed of broiler chicks (Stanley *et al.*, 2004). Yeast cells improve the internal mucosa aspect and it might suggest why the performance of broiler chicken is improved. Broiler receiving yeast to replace part of the premix had better average weight gain and feed conversion ratio (Nilson *et al.*, 2004). Better weight gain and feed conversion ratio were found among broilers fed with 0.2 to 1.0% of brewer's yeast (Churchil and Mohan, 2000). Blood is a major index of physiology, pathology and nutritional status of any animal (Adejinmi *et al.*,

2000). The studies of haematological parameters in broiler chicken provide a means of accessing the health status of the birds (Kral and Suchy, 2000). Therefore, the objectives of this study were to evaluate the effect of yeast (*Saccharomyces cerevisiae*) supplementation on the growth performance characteristics and haematological parameters of broiler chickens.

Materials and Methods

Experimental site: The experiment was conducted at the Teaching and Research Farm of the Federal College of Animal Health and Production Technology, Moor Plantation, Ibadan.

Experimental Animals, Management and design: A total of one hundred and sixty five (165) day old Cobb® 500 chicks were purchased from a reputable hatchery in Ibadan and used for this experiment. They were brooded for two (2) weeks under similar managerial and hygienic conditions. All vaccination schedules and medication were followed accordingly. Birds were supplied with feed and water *ad libitum*. After one week of adaptation period, the birds were randomly allotted to five dietary treatments in a completely randomized design and the experiment lasted for nine weeks.

Preparation of Experimental Diet: Yeast was incorporated into the diets at varying levels of 0, 1.5, 2.0, 2.5 and 3.0% respectively to formulate

five dietary treatments as indicated in Table 1 and 2.

Data Collection

Feed intake and live weight changes: The growth of the birds in response to the experimental diets was monitored by taking their pre-experimental body weights, followed by weighing on a weekly basis prior to feeding. Feed offered daily per bird was recorded and refusal was weighed and recorded to compute feed intake on daily basis.

Collection of blood samples: 3ml of blood samples was collected from the nine (9) randomly selected experimental birds per treatment via the jugular vein using hypodermic needle and

syringe into the sample bottles containing Ethyl Diamine Tetra Acetic Acid (EDTA) as anticoagulant and the bottles were gently rolled over to ensure proper mixing of the blood with EDTA to prevent coagulation.

Chemical Analysis and Statistical Analysis

Aliquot of daily feed samples (concentrates) was collected, oven-dried, ground and sieved through a 2-mm sieve and stored in airtight container for proximate (AOAC, 2000). Data collected were subjected to analysis of variance while significant means among variables were separated using Duncan Multiple Range test according to procedure of (SAS, 2004).

Table 1 : Proximate analysis of the experimental diet containing varying levels of yeast at starter phase

Parameters	T ₁ (0%)	T ₂ (1.5%)	T ₃ (2.0%)	T ₄ (2.5%)	T ₅ (3.0%)
Dry Matter	88.95	89.24	89.08	89.44	88.97
Crude protein	21.58	20.97	21.29	21.65	21.78
Crude Fibre	3.94	3.94	3.94	3.94	3.94
Ether Extract	3.57	3.68	3.64	3.55	3.73
Total Ash	6.57	6.71	6.49	6.89	6.38
Nitrogen free extract	53.60	53.80	53.87	53.32	53.03

Table 2 : Proximate analysis of the experimental diet containing varying levels of yeast at finisher phase

Parameters	T ₁ (0%)	T ₂ (1.5%)	T ₃ (2.0%)	T ₄ (2.5%)	T ₅ (3.0%)
Dry Matter	95.31	89.36	88.92	89.15	88.89
Crude protein	20.89	20.97	21.15	20.78	21.49
Crude Fibre	2.65	2.65	2.65	2.65	2.65
Ether Extract	3.61	3.66	3.59	3.63	3.72
Total Ash	6.66	6.28	6.93	6.85	6.37
Nitrogen free extract	54.33	54.12	53.37	53.67	53.43

Table 3: Effect of yeast Supplementation on the Performance Characteristics of Broiler Chicken

Parameters	T ₁ (0%)	T ₂ (1.5%)	T ₃ (2.0%)	T ₄ (2.5%)	T ₅ (3.0%)	SEM±
Initial wt (g/b)	115.37	112.43	109.20	108.40	107.70	1.25
Final wt (g/b)	1329.00 ^b	2045.00 ^a	2090.50 ^a	2041.9 ^a	2152.00 ^a	98.95
TWG (g/b)	1233.70 ^b	1932.50 ^a	1981.30 ^a	1933.50 ^a	2044.80 ^a	99.57
DWG (g/b/d)	22.03 ^b	34.51 ^a	35.38 ^a	34.53 ^a	36.51 ^a	1.78
TFI (g/b)	3444.20 ^b	4100.00 ^a	3970.40 ^a	3779.00 ^{ab}	3854.6 ^{ab}	82.26
ADFI (g/b/d)	61.50 ^b	73.21 ^a	70.90 ^a	67.48 ^{ab}	68.83 ^{ab}	1.47
FCR	2.85 ^a	2.44 ^b	2.00 ^b	1.97 ^b	1.94 ^b	0.11

^{a, b}, Means in the same row having different superscripts are significantly different (P<0.05). DWG: Daily weight gain, ADFI: Average daily feed intake, FCR: Feed Conversion Ratio

depends on the youth of today. With these attributes, the youth are of vital importance in the implementation of sustainable livestock production and rural development programmes. In the context of this study, there is limited documented information on the involvement of youths in livestock production.

This study tends to look at the involvement of the youth in livestock production in Giwa Local Government Area of Kaduna state.

Objectives of the Study

Against the background of the significance of youths to the livestock production development process and the significant roles of institutionalized framework to enhance youths' participation in livestock production, this study was conceived to achieve the following objectives:

1. Describe the socio-economic characteristics of the respondents in the study area.
2. Describe the number of youth involvement in livestock production in the study area.
3. Determine the reasons why some youth in the study area are not involved in livestock production.
4. Describe the type of livestock kept by the youth in the study area.
5. Identify challenges encountered by the youth in livestock production.

Materials And Methods

The Study Area

The study was conducted in Giwa Local Government Area of Kaduna State, Nigeria. The location is within the geographical area, referred to as the Northern Guinea Savannah which has long been "recognized as highly suitable for crop and animal husbandry" (Weber *et al.*, 1996). The study area is about 3,350 km² and lies between 11° 00' - 11° 30' N and 7° 00' - 7° 45' E. It is located northwest of Zaria and is about 640m above sea level (Otchere *et al.*, 1987). The average rainfall is 1100 mm and this spread from late April or early May to late October (Wet season). The mean maximum ambient temperature varies from 27-35°C depending on the season while the average

relative humidity during the wet season is about 72 and 21% during the period of dry cool weather of November to January as the harmattan (Oyedipe *et al.*, 1982)

Sampling Technique

Four out of the eleven wards in the study area were randomly sampled. Thirty youths were randomly selected from each of the four wards. A total of 120 youths were sampled.

Data Collection

A survey involving 120 youths was conducted. Structured questionnaire and oral interviews were used to elicit facts from the youths.

Analytical Techniques

Analysis of data was done by simple descriptive statistics such as frequency distribution and Percentage. A three-point Likert scale of; Very Serious=2; Serious=1 and Not Serious=0, with a midpoint of 1.0: mean score that are equal 1.0 or above indicate serious while scores less than 1.0 indicate not serious, was used to determine the challenges faced by youth involved in livestock production in the study area.

Result And Discussion

Socio-economic Characteristics of Respondents

Table 1 shows that majority of the respondents 66.6% were male only a few 33.33% were female, with a high percentage of the youth 45.8% between the ages of (21-26). Majority 63.33% of the respondents were unmarried, while 36.6% of the respondents are married. 68.33% of the respondents were involved in livestock production while 31.67% are not involved. This agrees with the finding of Matthews-Njoku and Ajaero (2006). This implies that livestock production employs a high percentage of youths especially in the rural areas where agriculture is the major occupation for self reliance and generation of income. Also 47.5% of the youth had secondary school education, suggesting that the youth had a moderate level of awareness about livestock production as a result of their level of education. This agrees with the finding of (Aphunu and Atoma, 2010). Finally, most of the respondents 60% were rural dwellers; this placed them in an advantage position in the practice of livestock production and make efficient use of available natural resources to promote food security as suggested by (Aphunu and Atoma, 2010).

Table 1: socio-economic characteristics of respondents

Characteristics	Frequency	Percentage %
Age		
15-20	22	18.33
21-26	55	45.8
27 and Above	43	35.8
Gender		
Male	80	66.67
Female	40	33.33
Marital Status		
Single	76	63.33
Married	44	36.67
Involvement in livestock production		
Yes	82	68.33
No	38	31.67
Level of Education		
None	13	10.8
Primary	35	29.17
Secondary	57	47.5
Post secondary	15	12.5
Residence		
Rural	72	60
Urban	48	40

Source: Field Survey Data 2015.

LIVESTOCK KEPT BY RESPONDENTS

Table 2 showed that youth in the study area are highly involved in livestock production such that, Majority 63.41% rear sheep, 58.54% rear poultry, 52.44% rear goat, 37.81% rear cattle, while a few

7.32% and 2.44% rear donkeys and camels respectively. Those who reared donkeys and camels said, they inherited it from their Parents. This is at variance with the finding of Gwary, *et al* (2008) who reported that youths are more interested in crop production than Livestock.

Table 2: Respondents of youth based on the type of animal they keep

Livestock	Frequency	Percentage %
Sheep	52	63.41
Poultry	48	58.54
Goat	43	52.44
Cattle	31	37.81
Donkey	6	7.32
Camel	2	2.44

*More than 100% due to multiple responses.

REASONS FOR NON-INVOLVEMENT IN LIVESTOCK PRODUCTION

Table 3 shows the response of youth not involved in livestock production. Majority 78.9% said livestock production is for the school drop-out and illiterates. This agrees with the findings of (Aphunu and Atoma 2010). 71.1% attributed their non involvement in livestock production to lack of finance. This concurs with the findings of (Arowolo, *et al.* 2013) youth cannot afford the

initial capital to establish their livestock farm, except they are aided. 63.2% identified lack of interest as reason for not involving in livestock production in the study area. This agrees with the findings of (Aphunu and Atoma, 2010) that youths are unfavorably disposed to participation in agricultural productivity and hence the massive drift to other non agricultural sector of the economy. A few 55.3%, saw Stress and labour as reason for not involving in livestock production.

Table 3: Response of some youth not involved in livestock production

Statement	Frequency	Percentage %
Livestock production		
Is for the school drop-out		
And illiterates	30	78.9
Lack of finance	27	71.1
No interest	24	63.2
Labour intensive/stress	21	55.3

*more than 100% due to multiple responses

Challenges faced by the Respondents in Livestock Production.

Table 4, indicated that cost of management (Means= 1.31), poor access to loan and credit facilities (Means= 1.33), lack of incentives from

government (Means = 1.15) were perceived as serious challenges faced by youth in livestock production. Aphunu and Atoma (2010) asserted that lack of incentive from government could hinder youth's involvement in agricultural productivity activities

Table 4: Challenges faced by Youth in livestock production

Challenges	VS	S	NS	WT	MS
Coast of Management	43	40	24	107	1.31
Poor access to loan and credit facilities	50	42	17	109	1.33
Lack of incentives from government	43	41	10	94	1.15
Lack of market for the product	15	18	43	76	0.93

VS= Very Serious, S= Serious, NS= Not Serious, WT= Weighted Total, MS= Mean Score.

Conclusion and Recommendation

The result of this study have shown that the majority of the youth involved in livestock production in the study area are male, most of the youth involved in livestock production were found to possess secondary education. The study further revealed that most of the youth reared livestock's such as sheep, poultry, goat, and cattle. Only a few kept donkeys and camels. Livestock production is for the school drop-out and illiterates, lack of finance and lack of interest are reasons given by some of the youth for not involving in livestock production. Also cost of management, poor access to loan and credit facilities and lack of incentives from government was perceived as serious challenges faced by youth in livestock production in the study area. Effort to tackle these challenges in addition to motivating and training the youth in modern livestock husbandry will assist in encouraging the youth to venture into livestock production, reduce the rate of youth unemployment and alleviate poverty in Nigeria.

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