ORAL ADMINISTRATION OF PROBIOTIC ON GROWTH PERFORMANCE OF COCKEREL CHICKEN

[1]Okusanya, P. O., [2*]Akinlade, O. O., [3]Jarikre, T. A., [4]Akinlade, O. O. and [5]Taiwo, V. O.
[1]Animal production Technology, [2]Animal Health and Production Technology; The Federal Polytechnic, Ilaro.
[3, 5]Veterinary Pathology Department, University of Ibadan,
[4]Federal College of Agriculture, Moor Plantation, Ibadan.
Corresponding author: olamilekan.akinlade@federalpolyilaro.edu.ng; +2347032042561

ABSTRACT
The contribution of poultry industry to the nutritional deficiency in the growing human populace cannot be over emphasized, as it supplies cheap and quick protein source. Aflatoxin contamination in poultry feed which causes aflatoxicosis has resulted into reduced feed intake, retarded growth and reduced weight gain in Cockerel chicken. A total of 120 cockerel chicks were randomly divided into four treatments (T), which included three replicates of ten birds each were fed with and without aflatoxin B1 (AFB1) or probiotic (P) additives over a period of three weeks. T1 (0 ml of P + 0 µi of Aflatoxins), T2 (AFB1, 35 µi/kg + 1ml of P/liter of drinking water), T3 (1ml of P/ liter of drinking water), and T4 (35 µi Aflatoxins per kg of feed). Data of cockerel chickens' body weight gain and feed conversion ratio were recorded and evaluated using one-way analysis of variance of SPSS package. The result showed a significant difference (P<0.05) in the initial weight, feed intake, final weight, weight gain, and daily weight gain. (T1) had the highest weight gain (372.52 g), while T2 had the best feed conversion ratio of 1.71, while T3 had the highest feed conversion ratio value of 1.79. In conclusion, the present results indicated that probiotic supplements improved the performance of cockerel chickens fed Aflatoxin B1 contaminated feed. The use of probiotics (Lactobacillus spp) in cockerel chicken production is recommended as a preventive measure to Aflatoxin contamination in cockerel feed.
Keywords: Chicks, Growth, Probiotics, Toxins

INTRODUCTION

Domesticated birds farmed for their eggs, meat, and feathers are known as poultry. From native and commercial chicken breeds to Muscovy ducks, mallard ducks, turkeys, guinea fowls, geese, quail, pigeons, and ostriches, they comprise a diverse array of birds (Abd El-Hack *et al.*, 2023).

Cockerels are among the most-reared chicken strains in Nigeria, they are young male line chicken that is majorly bred for meat. Managing the production of cockerels is simpler than that of broilers, especially in rural locations without access to modern amenities like electricity. Despite its relatively long maturity period, cockerel rearing has gained significant relevance due to its resilience and reasonably good survival rate (Yero, 2019).

Many fungal species create mycotoxins, which are naturally occurring poisons that are harmful to human health. Their extreme toxicity makes them a major public health problem (Berthiller *et al.,* 2018). Aflatoxins are one of the common mycotoxins found in livestock feed. They are produced by certain moulds, particularly *Aspergillus species* (*A. flavus* and *A. parasiticus*), which are abundant in warm and humid regions of the world. Aflatoxin contaminates crops in the field, at harvest, and during storage (Benkerroum, 2020).

To reduce the cost of production and long-term usage of synthetic drugs, there is a need to look for alternatives to synthetic antifungal drugs (Reuben *et al.,* 2021). Probiotics of genera *Bifidobacterium*, *Lactococcus*, *Lactobacillus*, *Bacillus*, and *Streptococcus* are commonly used in poultry production (Cervantes, 2015) and have proven to be a viable alternative because they are less toxic, and have little or no residual effects on the birds and the consumers of their products. (Krysiak *et al.,* 2021)

Experimental Site

The experiment was carried out at The Federal Polytechnic, Ilaro, at the Poultry Unit of the Agricultural Technology Department. It is situated in Ogun State, Nigeria's Yewa South Local Government area. Latitudes 6°37′46″N and 6°55′42″N and longitudes 2°47′24″E and 3°6′48″E are its coordinates (Weather Spark, 2017).

Preparation of Experimental Diets

Probiotics (P) (*Lactobacillus*) was purchased from a reputable laboratory and used for the experiment.

Experimental Animal and Management

We bought 120 cockerel chicks from a respectable commercial hatchery and brooded them for seven days. They were then divided into four (4) treatments, each consisting of thirty birds. Three replicates of each treatment were made, each containing ten (10) birds. Standard routine and occasional (vaccinations and medication schedules) management practices for chickens were strictly adhered to. Commercial feed and water were given *ad libitum* throughout the experimental period.

Experimental Design

The design of the experiment was Completely Randomized Design (CRD). Each treatment received the test ingredient as follows:

Treatment (T) 1: 0 ml of P + 0 µi of Aflatoxins
Treatment 2: 1ml of P per litre of water
Treatment 3: 35 µi of Aflatoxins per kg of feed + 1ml of P per litre of water
Treatment 4: 35 µi Aflatoxins per kg of feed

Data Collected

The feed intake and weight gain were measured using a weighing balance (Camry® - 20 kg) and feed conversion ratio calculated following standard procedures.

Data Analysis

Data were subjected to one-way Analysis of Variance (ANOVA) and the means of the treatments were compared with Duncan's Multiple Range Test using the SPSS (IBM 26, 2022) software.

Result and Discussion

Result

Effect of Probiotic on growth performance of cockerels fed aflatoxin B1 contaminated feed

The result of effect of probiotic on growth performance of cockerels fed aflatoxin B1 contaminated feed is presented in Table 1. The initial weight, feed intake, ultimate weight, weight gain, and daily weight gain all showed significant variations ($P<0.05$), as this table demonstrates. (T1) had the highest weight gain (372.52 g), while (T2) had the lowest weight gain (334.39 g). T1 recorded the highest feed intake (975 g) while T2 had the least (886.20 g). T1 had the highest final weight (556.52 g) while T2 had the lowest (518.39 g). T2 recorded the least and the best feed conversion ratio of 1.71, while T3 had the highest feed conversion ratio value of 1.79.

Table 1. Effect of Probiotic on growth performance of cockerels fed aflatoxin B1 contaminated feed

Parameters	T1	T2	T3	T4	SEM	P-values
Initial weight (g)	184.00^{b}	184.00^{b}	188.00^{a}	183.20^{b}	0.60	0.01
Final weight (g)	556.52^{a}	518.39^{b}	522.73^{b}	539.13^{c}	4.90	0.00
Weight gain (g)	372.52^{a}	334.39^{c}	334.73^{c}	355.93^{b}	6.23	0.00
Weight gain (g/b/d)	17.73^{b}	15.92^{c}	15.93^{c}	18.03^{a}	0.29	0.01
Feed intake (g)	975.00^{a}	889.20^{c}	940.80^{b}	939.86^{b}	9.3	0.01
FCR	1.75	1.71	1.79	1.74	0.01	0.11

Means with different subscripts are significantly different ($P<0.05$), FCR is the feed conversion ratio, and weight gain (g/b/d) is the weight gain per bird per day.

DISCUSSION

The result of this present study revealed that birds fed with probiotic and aflatoxin B1 feed for the first three weeks of life showed increase in feed intake, and weight gain when compared to the other groups. This outcome further explained the report of (Zhao *et al*., 2020) who included probiotic in cockerel diets to reduce the effect of aflatoxin and reported a significant increase in their final weight gain and feed intake compared to the other groups. These positive outcomes are likely attributed to the birds' overall good health, possibly influenced by the addition of probiotic. The good bacteria like probiotics can boost the immune system, improve nutrient absorption, and improve gastrointestinal health (Zhao *et al*., 2020). Probiotics may help lower the toxicity of aflatoxin B1 by binding to the toxin, blocking its absorption in the gut, and encouraging its elimination from the body when given to cockerels fed toxin (Khan et al., 2019) It is also in correspondence with (Liu *et al*.,2017) report, who added *Bacillus subtilis* in fish feed and resulted in increased in weight gain and feed conversion (incorporation of *Lactobacillus* spp. enhanced final weight and feed conversion efficiency in Asian seabass). According to (Ghanei-motlagh *et al*., 2021) there was an observed increase in the weight of *Lates calcarifer* (Barramundi fish) when fed a mixture of *Bacillus* spp., fish feed and *Lactobacillus* spp.

CONCLUSION AND RECOMMENDATION

This research concluded that feeding cockerel chicken with probiotics have positive effects on their growth performance. The use of probiotics especially *Lactobacillus* spp. in cockerel chicken production is recommended.

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