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Effect of Alternate Vaccination Schedule on Growth Performance of Broiler Chickens in Niger State

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Abstract

An experiment was conducted in Minna using two hundred day-old Hubbard broiler chicks to determine their growth performance to the alternate vaccination schedule. The birds were grouped into two treatments consisting of 100 birds each with ten replicates per treatment. Each replicate consist 10 birds. Broiler chickens in group C were placed on conventional vaccination schedule (Control), while chickens in group A were placed on alternate vaccination schedule at starter and finisher phase respectively over a 63 day period. Feed and water were given *ad libitum.* Data were collected on feed intake and body weight in the two treatment groups. There was no significant ($p>0.05$) difference in their feed intake, body weightand feed conversion ratio. It was concluded that alternate vaccination schedule in broiler chickens does not adversely affect the growth performance of the birds and either the conventional vaccination schedule or the alternate vaccination schedule could be adopted by broiler chicken farmers. It was further recommended that similar research should be conducted using other poultry species to make their vaccination program flexible.

Keywords: Broiler chicken, vaccination, growth performance

Introduction

Poultry industry plays a very important role in the world economy and in the Nigerian economy too. It provides a source of employment and some of the most important food items for the Nigerian society (Muhammad, 2010). Rapid population growth in Nigeria has resulted in the fast expansion of industrial large-scale commercial poultry farming (Adeyemo and Onikoyi, 2012).

However, this rapid growth and expansion still have some factors militating against it, as Poultry diseases are the major constraints to poultry farming in Nigeria.

The problem is compounded by near inadequate veterinary personnel and quality animal drugs occasioning poor performance, huge mortalities and loss of income (Butcher and Miles, 2008). One of the major diseases affecting poultry in Nigeria is infectious diseases especially Newcastle disease and Infectious bursal disease among many others; with a devastating effect resulting from loss of chickens and income.

Newcastle disease and Infectious bursal disease are part of the most rampant viral diseases of poultry in Nigeria (Mayo, 2002). They cause high morbidity, mortality and decreased productivity in infected chickens (Wang *et* al.*,* 2015). The major tools that can be used to provoke immunity in birds for both the prevention and control of the spread of diseases are vaccination, good nutrition and immune-modulation (Pangasa and Singla 2007).

Timely vaccination implies vaccinating at the appropriate age of the chickens for the vaccine and the environment where the chickens are kept. Factors that influence timing of vaccination include; the time required for maternal derived antibodies (MDA) to wane sufficiently to allow active immunization, and the nature and endemicity of the disease in the environment (Herman *et* al.*,* 2007) while the interval between vaccinations depends on the animal's immunogenic memory which in turn is determined by several factors including the nature of the antigen, use of live (attenuated) or killed vaccines, nature of adjuvant used, and route of administration (Abdu *et al.,* 2012).

Newcastle disease and IBD are endemic in Nigeria and control is based on immunization schedule and maintenance of good hygiene condition on the farm (Farooq *et al.,* 2003). Usually, standard and common vaccination schedules are used, which are not adapted to the specific conditions on the farm and to the immune status of the chickens (Herman *et al.,* 2007; Besseboua *et al.,* 2015). For varieties of reasons, vaccination schedules are seldom strictly adhered to by the resource-poor farmer. Vaccination of day old chicks against ND at the hatcheries is often practiced but such vaccinations do not confer lasting protection on the birds probably as a result of high levels of MDA in the chicks at hatch. Chicks are revaccinated against ND at about two days where veterinary services are readily available but again without recommendations from the hatcheries, consideration of the MDA status of the chicks or the immune status of the breeder hens. For the resource-poor rural dwellers, revaccination of birds is not very often possible.

Consequently, vaccinations are delayed, or birds are vaccinated haphazardly, or not vaccinated at all. Thus, even though vaccination of broiler chickens against ND and IBD is a common practice in the study area, farmers continue to face the challenge of frequent ND and IBD outbreaks, high mortalities, reduced productivity, and loss of income. High mortalities are usually ascribed to issues about vaccination whereas the absence of mortality exonerates vaccination-related problems. Low mortalities, good growth rate high carcass yield are part of performance indices. Therefore, apart from high mortalities, farmers do not recognize other possible consequences of no vaccination or the use of inappropriate vaccination program in broiler chickens. Given the multiplicity of vaccination schedules for ND and IBD in the study area, it would be necessary to evaluate the effect if any, of alternate vaccination schedule on growth performance of broiler chicks of unknown MDA status reared in the study area. Forgetfulness, skipping schedule, mixed schedule and inconsistency of farmers to conventional routine vaccination schedule has brought about this research. The determination of the implication of several farmers' inconsistent vaccination programs and its consequent effect should be measured so that chickens farmers will be well informed. The determination of this implication will help to minimize economic losses due to diseases in poultry production, since vaccination still remains the best approach to disease prevention.

The objective of this study was to evaluate the growth performance of broiler chickens placed on an alternate vaccination schedule.

Materials and Methods

The experiment was carried out at the old Livestock Teaching and Research Farm of the Department of Animal Production, Federal University of Technology Minna, Niger State (Bosso campus), Nigeria. Minna is found in the Southern Guinea Savanna zone of Nigeria (Tanko *et al*., 2012).Two hundred day-old unseeded broiler chicks were used for the study which lasted for 60 days. The broiler chickens and vaccines used (Newcastle disease and infectious bursal disease vaccine (lasota and gumboro respectively) were procured from Alfa veterinary Consult, opposite SAFTECH Hotel, Shiroro Road, Tunga, Minna, Niger State.

The birds were randomly allowed into two groups, namely; the conventional vaccination schedule group which was the control and the alternate vaccination schedule group as shown in table1. Each group had ten chicks per replicate.The experimental birds were fed at *ad-libitum* with broiler starter from day one of age to 28 days (brooding phase) and broiler finisher from 29th day to the 63rd day. Clean drinking water was also provided *ad-libitum* for the birds.Table 2 shows the experimental starter and finisher feed fed to the broiler chickens respectively. Sanitation and other health management practices were strictly observed during the experiment.

Table 1 Experimental vaccination program

Period (days)	conventional vaccination schedule	Alternate vaccination schedule	Route of administration
1	NDV (i/o) hatchery	NDV (i/o) hatchery	Intra-ocular
7	IBDV (gumboro)	NDV (lasota)	Orally
14	NDV (lasota)	IBDV (gumboro)	Orally
21	IBDV (gumboro)	NDV (lasota)	Orally
28	NDV (lasota)	IBDV (gumboro)	Orally

Key: NDV: Newcastle Disease Vaccine; IBDV: Infectious Bursal Disease Vaccine, I/O: intra-ocular.

Data collected were; initialweight, final weight, body weight gain, average daily weight gain, total feed intake.Data collected were derived using the following formula:

- Initial weight = weight of the experimental birds at the start of the experiment period
- Final weight = weight of the experimental birds at the end of the experiment period
- Body weight gain = Final weight — Initial weight
- Feed Intake = feed supplied — left overfeed

Data collected were subjected to independent sample T-test for statistical analysis using Statistical Package for Social Sciences (SPSS) 17. T-test values of ($p<0.05$) were considered significant.

Table 2: Experimental Diet (starter and finisher) for Broiler Chickens

Feed ingredients	Starter diet (%)	Finisher diet (%)
Maize	49.00	54.00
Maize bran	5.00	9.00
Soya bean meal	39.00	29.00
Fish meal	2.00	3.00
Bone meal	2.50	2.00
Limestone	1.50	2.00
Methionine	0.25	0.25
Lysine	0.25	0.25
Premix	0.25	0.25
Salt	0.25	0.25
Total	100	100
CP	24.05	20.02
ME (Kcal/kg)	2826.70	3001.88

Results and Discussion

Results of the performance characteristics of broiler chickens placed on different vaccination schedule were presented in Table 3. The result of thisstudy showed that, there were non-significant differences (p>0.05) among treatments means in initial weight, final weight, total weight gain, average daily weight gain, feed intake and feed conversion ratio. This contradicts the findings of Butcher and Miles(2008) who reported variation in the growth performances of chickens such as feed intake, feed conversion ratio and body weight as influenced by different vaccination programs.

From the results above, it was concluded that alternate vaccination schedule in broiler chickens does not adversely affect the performance and health of the birds and that either the conventional vaccination schedule or the alternate vaccination schedule could be adopted by broiler chicken farmers.

However, further study with the same objective is recommended to find out the consistence of the study with other poultry species.

Table 3: Performance Characteristics of Broiler Chickens Placed on Different Vaccination Schedule.

Parameters	Convectional group	Alternate group	LS
Initial weight (g/bird)	46.10 ± 2.13	47.00 ± 2.00	NS
Final weight (g/bird)	1740.00 ± 154.200	1655.00 ± 103.95	NS
Total weight gain (g/bird)	1693.90	1608.00	NS
Average Daily Weight gain (g/bird)	26.89	25.52	NS
Total feed intake (g/bird)	4508.29	4523.18	NS
Average feed intake (g/bird/day)	71.56	71.80	NS
Feed conversion ratio	2.66	2.81	NS

Mean ± standard error of the mean,LS: Level of Significant, NS: not significant

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