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EFFECT OF *Vernonia amygdalina* and *Moringa oleifera* LEAF MEALS SUPPLEMENTATION ON THE GROWTH PERFORMANCE OF BROILER CHICKS

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Abstract

The study was carried out to determine the effect of diets supplemented with *Vernonia amygdalina* leaf meal (VALM), *Moringa oleifera* leaf meal (MOLM) and the mixture of VALM and MOLM. One hundred and forty four day old Arbor-acre broiler chicks were randomly distributed to 4 dietary treatments replicated thrice with 12 birds per replicate in a Complete Randomised Design experiment. T1 (control diet, basal diet without supplementation of leafmeal), T2 (0.2% VALM), T3 (0.2% MOLM), T4 (0.2% of mixture of VALM and MOLM i.e 1:1). The average final live weight and daily weight gain of birds on control diet and treatment 4 were significantly ($p < 0.05$) higher than the birds on treatments 2 and 3. The daily feed intake of birds on treatments 2 and 3 were significantly ($p < 0.05$) lower compared to birds on control diet and treatment 4 while the feed conversion ratio (FCR) of birds on control diet had the lowest FCR at 2.10 followed by birds on treatments 4, 3 and 2 at 2.15, 2.17 and 2.28 respectively. Apart from the birds on control diet with highest final live weight and lowest FCR, the mixture of VALM and MOLM supplementation also enhanced the body weight gain of the birds and it further improved FCR numerically. Aside the control diet, the birds fed diet 4 (mixture of VALM and MOLM) perform better, the mixture of herbs in broiler chicks diets might have prevented the colonization of the pathogens and improved the production and activities of digestive enzymes.

Keywords: Growth performance, broiler chicks, *Vernonia amygdalina*, *Moringa oleifera*

Introduction

Antibiotics growth promoters in animal production are practiced for decades to enhance growth and to improve the feed efficiency thereby improving the health status of the animals. The inclusion of antibiotics increases the development of resistant microbes and produces residues in animal products (Sojoudi *et al.*, 2012). Since 2006 that European Union had ban the use of antibiotics, the use of in-feed antibiotics is under threat. As a result, the ban has resulted to increase in prevalence of resistance of antibiotics in chicken (Kabir, 2009). Some herbs contain many bioactive compounds that exhibit medicinal properties and enhance the growth performance, improve health and quality of animal products. In broiler diets, the beneficial effects of medicinal plants and their various products as phytochemical feed additives are proven (Bozkurt *et al.*, 2012b). This effect may be due to the synergistic action of various active molecules in them and the greater efficiency in the utilization of feed resulting in enhanced growth and production (Hashemi and Davoodi, 2010). *Vernonia amygdalina* contains bioactive compounds vernolide and vernodalol. Both compounds exhibited a significant bactericidal activity against gram positive organism (Sani *et al.*, 2012). *Moringa oleifera* leaf possesses antimicrobial, antioxidant, antipyretic effect of the phytochemicals in them (Ajayi and Fadeyi, 2015). Presently, little attention had been given to effect of herbal mixtures on poultry and this may be due to complexity brought about by the variability of bioactive compounds, it was been suggested by Brenes and Roura (2010) that there could be interactions of these herbs which needs to be studied.

The aim of this study was to determine the effect of supplementary leaf meals of *Vernonia amygdalina* and *Moringa oleifera* and their mixture on growth performance of broiler chicks.

Materials and Methods

The experimental diets were prepared at the Poultry unit of the Teaching and Research farm of the Department of Agricultural Technology, Federal Polytechnic, Ado-Ekiti, Ekiti State. *Vernonia amygdalina* and *Moringa oleifera* leaves were harvested fresh from maturing stems. The fresh leaves were subjected to air drying in an open cleaned concrete floor space until moisture content became constant at 13%. The air dried leaves were later milled using a commercial feed milling machine. The leaves were analysed for proximate composition (AOAC 2005). Basal diets were formulated for the starter (0-28 days of age) according to NRC (1994) recommendations

Four experimental diets were formulated and designated as diet 1, 2, 3 and 4 such that diet 1 was the basal diet without supplementation, diets 2, 3 and 4 were supplemented with 0.2% *Vernonia amygdalina* leaf meal (VALM), 0.2% of *Moringa oleifera* leaf meal (MOLM) and 0.2% mixture of VALM and MOLM i.e (1:1), respectively for the starter diets. One hundred and forty four day old Arbor-acre broiler chicks were randomly distributed to 4 dietary treatments with 12 birds per replicate. The birds

were replicated thrice using a Complete Randomised Design. Feed and water were provided *ad-libitum* throughout the experimental period during which records on daily feed intake were recorded and the body weight determined on weekly basis, thereafter average body weight gain and feed conversion ratio (FCR) were calculated. The birds were given necessary medications and vaccinations. Data were analysed statistically using one-way analysis of variance (ANOVA) and significant means were compared using Duncan's Multiple Range Test at 5% significant level.

The analysis was done using SPSS17.Windows.

Results and Discussion

The effect of VALM, MOLM and the mixture of VALM and MOLM on growth performance of broiler chicks is presented in Table 1. The final liveweight and daily weight gain of birds on control diet and treatment 4 were similar ($p>0.05$) but significantly ($p<0.05$) higher than birds on treatments 2 and 3. The daily feed intake of birds on diets 2 and 3 were similar ($p>0.05$) but significantly ($p<0.05$) lower than birds on control diet and diet 4. The lowest feed conversion ratio (FCR) was recorded for birds on control diet at 2.10 while the highest FCR was recorded for birds on treatment 2 at 2.28.

Table 1: Effect of herbal supplementation on growth performance of broiler chicks (0-28day)

Parameters	Treatments				SEM
	1 (0%)	2 (0.2%)	3 (0.2%)	4 (0.2%)	
Average initial weight (g)	34.40	34.84	34.67	34.38	0.52
Average final liveweight (g)	751.39 ^a	641.90 ^c	683.17 ^b	724.51 ^a	13.07
Average daily weight gain (g)	26.84 ^a	22.93 ^c	24.40 ^b	25.88 ^a	0.47
Average feed intake (g)	1580.00 ^a	1462.33 ^b	1479.67 ^b	1556.63 ^a	17.35
Average daily feed intake	56.43 ^a	52.22 ^b	52.87 ^b	55.59 ^a	0.61
Feed conversion ratio	2.10 ^c	2.28 ^a	2.17 ^b	2.15 ^{bc}	0.02

Means with different superscript on the same row differ significantly ($p<0.05$)

The basic reasons of including herbs in chick diets are to impact the metabolism by combating stress and microbial activity (Sanjyal and Sapkota, 2011). The overall improvement by equal mixture of VALM and MOLM on final liveweight and daily weight gain in this study revealed that the mixture of the herbs i.e VALM and MOLM enhanced growth performance of broiler chicks. Apart from the control diet, birds fed diet 4 (mixture of VALM and MOLM) perform better, the combination of herbs in broiler chicks diets might have prevented the colonization of the pathogens and improved the production and activities of digestive enzymes. The improved performance recorded for birds on treatment 4 may be attributed to the increased secretion of digestive enzyme and enhanced nutrient utilization in liver. The antibacterial action of essential component of the combination of herbs may suppress the growth of pathogenic bacteria on one hand and promote the growth probiotic bacteria in the gut.

The FCR of birds on mixture of herbs was numerically lower than FCR of birds on VALM and MOLM. The antibacterial, antiprotozoal, hepatoprotective properties of VALM and MOLM had been reported by Udochukwu *et al.*, 2015; Adewole *et al.*, 2015; Ajayi and Fadeyi, 2015). These suggest the reasons why herbs or medicinal plants may be used as alternative to antibiotic growth promoters because they exhibit antimicrobial properties and thus can form integral part of poultry nutrition (Gbenga *et al.*, 2009).

Conclusion

The excellent performance of birds on diet supplemented with the mixture of these leaves (VALM and MOLM) suggests the positive effect of bioactive compounds present in both VALM and MOLM.

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