HAEMATOLOGICAL INDICES OF BROILER CHICKEN FED VARYING LEVELS OF *ALOE-VERA* GEL IN WATER

Akinosun, A.A., Balogun, A.S., Shobanke, I.A., Raji, M.O., Oloko, A.B & Bako, B.A

Department of Animal Production Technology

Oyo State College of Agriculture and Technology, Igboora, Oyo State

Email – akinbola_akin2113@yahoo.com

+2348035607241

ABSTRACT

The study was conducted at the Poultry Unit of the Teaching and Research Farms of Oyo State College of Agriculture and Technology, Igboora, Nigeria.A total number of 96 day old unsexed broiler chicks were purchased from a reputable farm at Ibadan for the experiment. At 8 days of age, birds were weighed and randomly allotted into 4 feeding treatments of 3 replicates consisting of 8 birds in a completely randomized design (CRD).T1 control, T2 (30 ml of AVGE + 1 litre of water), T3 (60 ml of AVGE + 1 litre of water), T4 (90 ml of AVGE + 1 litre of water).The experiment lasted for 49 days. The results obtained show that aloe vera gel extract (AVGE) supplementation in water significantly ($p<0.05$) affected Packed cell volume (PCV) (%), haemoglobin (Hb) (g/dL), red blood cells (RBC) ($x10^9$/dl), heterophil, lymphocyte, monocyte eosinophil as well as basophil. White blood cells (WBC) **(**$x10^3$/dl) was however similar ($p>0.05$) across the treatment group. PCV was observed to be highest at T3 (24.83) while T1 (24.00), T2 (24.00) and T4 (24.17) show no difference in the means obtained. Similarly, RBC was observed to be highest at T3 (2.64) and lowest at T4 (2.39) while T1 and T2 had comparable significant means of 2.49 and 2.52 respectively. Hb was also observed to be highest at T3 (9.14) while T1 (8.79), T2 (8.79) and T4 (8.62) had comparable mean value across the treatment. Heterophil was however highest at the control T1 (42.00) while there were no differences in the means obtained in T2 (37.33), T3 (38.33) and T4 (40.67). WBC also had ranged values between 10.55 – 11.47 (T3 – T2) across the treatment groups. It can be concluded from the study that the groups treated with Aloe vera gel extract showed better significant haematological properties when compared to the control groups. It is thus recommended that farmers can adopt the use of 60 ml of aloe vera gel extract in oral supplementation as an alternative to commercial antibiotics.

Key words: Broiler, Aloe vera gel extract, PCV, WBC, RBC

INTRODUCTION

Antibiotic growth promoters have been helpful in improvement of growth performance and feed conversion ratio in poultry (Izat *et al*., 1990; Dibner and Buttin, 2002 and Miles *et al*., 2006) However, constant treatment of poultry with antibiotic may result in residues of these substances in poultry products and bacteria resistance against treatments in human body. Due to such threats to human health, use of antibiotics in poultry is banned (Hinton, 1988; Botsoglou and Fletouris, 2001; Alcicek *et al*., 2004 and Owens *et al*., 2008). Many studies have been carried out on using additives, including herbs, as alternatives to antibiotics, with direct or indirect effects on intestinal micro-flora, in poultry products (Taylor, 2001). *Aloe vera is* used as a multi-purpose medicine with anthelminthic, antimicrobial, anti-inflammatory and anti-oxidative properties. They also contain carotenoids, vitamins, terpernoids and phenols among other compounds (O'Brien *et al*., 2011). They are used in treating newcastle disease, internal parasites, fowl typhoid, coccidiosis, gall sickness and inflammation (Dold and Cocks, 2001). Apart from the above, anti-mutagenic effects and anti-hypersensitivity effects of *Aloe vera* have also been reported by some researchers (Strickland and Ulijaszek, 1993). With numerous properties, *Aloe vera* is among the most well-known herbs. Thus, the study aim to examine the use of oral supplementation of *aloe vera* gel without commercial antibiotics and multivitamin on the haematological indices of broiler chicken

MATERIALS AND METHODS

The study was carried out at the Poultry Unit of the Teaching and Research Farms of Oyo State College of Agriculture and Technology, Igboora, Nigeria

Preparation of 50 % *Aloe vera* gel extract

Fresh Aloe leaves were harvested from Igbo-ora community and environs. Aloe gel infusion was prepared accordingly to the method of Durrani *et al*. (2008). The leaves were washed with clean water to remove dirt. Aloe Vera gel was extracted from 1kg leaves manually by making a cut on the leaves with a pocket knife. The gel was scooped out with a small spoon and drained into in a beaker. A 50% concentrated infusion was prepared by taking 500 ml of fresh gel in a glass bottle and 500 ml of boiled water at room temperature was poured on it. The bottle was then agitated for about 5-7 minutes to ensure thorough mixing, after which it was kept for 30 minutes to 40minutes at room temperature prior to use. The homogenized gel extract was prepared at intervals of two (2) days and served to the animals fresh according to treatments.

EXPERIMENTAL PROCEDURE

A total number of ninety-six (96) day old unsexed broiler chicks were purchased from a reputable farm at Ibadan for the experiment.At 8 days of age, birds were weighed and randomly allotted into 4 feeding treatments of 3 replicates consisting of 8 birds in a completely randomized design (CRD). T1 control, T2 (30 ml of AVGE + 1 litre of water), T3 (60 ml of AVGE + 1 litre of water), T4 (90 ml of AVGE + 1 litre of water).Treatment 1 served as the control which contained vitalyte and antibiotics, representing the common commercial drug supplement that is usually made available to birds.

Table 1: Composition of the basal diet (%)

Ingredient	**Starter (1-21 days)**	**Finisher(22-49 days)**
Maize	58.00	63.80
Soybean meal	34.50	28.40
Soya oil	3.30	3.70
Di-calcium phosphate	1.70	1.70
Lime stone	1.80	1.70
Salt {NaCl)	0.25	0.25
Methionine	0.15	0.15
Premix*	0.30	0.30
Total	**100**	**100**
Calculated composition (%)		
Crude protein	22.10	19.18
Energy (MEKcal/kg)	3030	3100

RESULTS AND DISCUSSION

Table 2: Effects of *aloe vera* gel extract (AVGE) on haematological indices of broiler chicken

Parameters	T1	T2	T3	T4	SEM ±
PCV (%)	24.00^{ab}	24.00^{ab}	24.17^{a}	24.83^{ab}	0.33
RBC (x10^{6}/dl)	2.49^{ab}	2.52^{ab}	2.64^{a}	2.39^{b}	0.04
Hb (g/dl)	8.79^{ab}	8.79^{ab}	9.14^{a}	8.62^{ab}	0.20
WBC (x10^{3})	10.72	11.47	10.62	10.55	0.46
Heterophil (%)	42.00^{a}	37.33^{b}	38.33^{b}	40.67^{ab}	2.13
Lymphocyte (%)	57.33^{ab}	60.33^{a}	58.33^{ab}	57.00^{ab}	2.24
Monocyte (%)	0.67^{ab}	0.33^{b}	1.33^{a}	0.67^{ab}	0.23
Eosnophil (%)	0.00^{c}	1.67^{ab}	2.00^{a}	1.33^{ab}	0.31
Basophil (%)	0.00^{b}	0.33^{a}	0.00^{b}	0.33^{a}	0.09

^{a,b,c} Means on the same rows with different superscript differs significantly ($p< 0.05$) * PCV – Pack cell volume, Hb – Haemoglobin, RBC –Red blood cells, WBC – White blood cells SEM= Standard Error of the Mean

The table shows that aloe vera gel extract (AVGE) supplementation in water significantly ($p<0.05$) affected Packed cell volume (PCV) (%), haemoglobin (Hb) (g/dL), red blood cells (RBC) (x10^{9}/dl), heterophil, lymphocyte, monocyte eosinophil as well as basophil. White blood cells (WBC) **(**x10^{3}/dl) was however similar ($p>0.05$) across the treatment group. PCV was observed to be highest at T3 (24.83) while T1 (24.00), T2 (24.00) and T4 (24.17) show no difference in the means obtained. Similarly, RBC was observed to be highest at T3 (2.64) and lowest at T4 (2.39) while T1 and T2 had comparable significant means of 2.49 and 2.52 respectively. Hb was also observed to be highest at T3 (9.14) while T1 (8.79), T2 (8.79) and T4 (8.62) had comparable mean value across the treatment. Heterophil was however highest at the control T1 (42.00) while there were no differences in the means obtained in T2 (37.33), T3 (38.33) and T4 (40.67). WBC also had ranged values between 10.55 – 11.47 (T3 – T2) across the treatment groups.

DISCUSSION

It was observed that the PCV values obtained from all treatments fell within the normal range of 24.00-45.20% for healthy chickens as reported by (Mitruka and Rawnsley, 1997) this indicates that AVGE supplementation was suitable and adequate for broiler chickens, and the birds were not anaemic and that the dietary protein is of good quality (Schalm *et al.*, 1975). Since the blood is often time used as a physiological index or indicator for diseases diagnosis, nutrition status and health condition of the birds. Olafedehan *et al. (*2010) reported that blood acts as a pathological reflector of the status of exposed animals to diseases and other conditions. Isaac *et al.*, (2013) reported that animals with good blood composition were likely to show good performance. Mhonzya (2002) reported that haemoglobin and packed cell volume levels are normally higher in a well-nourished than poorly fed animal. But since all the levels of AVGE supplementation did not fall below the range then it implies there was no case of anaemia in the birds. The values obtained in RBC indicate also that the red blood cells were not reduced by the AVGE supplementation which also shows that the diet also allows for proper oxygen and carbondioxide transport. This supports Ojhas *et al*., (2011) who stated that oral administration of aloe vera gel extract significantly increased the RBC count. As reported by Isaac *et al.* (2013), red blood cell is involved in the transport of oxygen and carbon dioxide in the body. Thus, a reduced red blood cell count implies a reduction in the level of oxygen that would be carried to the tissues as well as the level of carbon dioxide returned to the lungs (Ugwuene, 2011; Soetan *et al.*, 2013 and Isaac *et al*, 2013). From the findings, lymphocytes and heterophiles showed significant difference ($P<0.05$). Iraql (2014) reported improvement of broiler chicken immune system and significant increase of lymphocytes and heterophiles with garlic extract supplementation due to immune-stimulant effect of garlic. The significant effect of most parameters

measured at 60 ml of AVGE + 1 litre of water in this study suggests that it may be an appropriate level of inclusion.

CONCLUSION AND RECOMMENDATION

It can be concluded from the study that the groups treated with Aloe vera gel extract showed better significant haematological properties when compared to the control groups. It is thus recommended that farmers can adopt the use of 60 ml of aloe vera gel extract in oral supplementation as an alternative to commercial antibiotics.

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