

EFFECT OF ALOE VERA GEL ON HEMATOLOGICAL PARAMETERS OF NOILER COCKS

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ABSTRACT

The experiment was conducted to determine the effects of aloe vera gel on hematological parameters of Noiler Cocks. The experiment was conducted at the Teaching and Research Poultry Farm of Federal Polytechnic, Bauchi, Bauchi State, Nigeria. A total of twelve Noilers cocks with average weight of 4.3kg were purchased from a back yard farmer in Bauchi metropolis. The birds were housed individually in battery cage system in completely randomized desing. Treatment one (T1) was provided with aloe vera free water while treatments two (T2) and three (T3) were provided with 10% and 20% aloe vera gel per litre of drinking water respectively. The birds were fed uniformly with a standard commercial diet and water was supplied ad-libitum. The experiment lasted for two months. Parameters determined from the blood sample collected were hemoglobin (Hb), Hematocrit (HCT), white blood cell (WBC), red blood cell (RBC), mean corpuscular volume (MCV), mean corpuscular hemoglobin (MCH) and Mean corpuscular hemoglobin concentration (MCHC). The result showed that the HCT values of the control (44.65) was significantly higher than 10% (292.45) and 20% (299.45) aloe vera gel. The WBC value was significantly higher in 20% aloe vera gel (299.45) than the control (284.60). At 20 and 10% aloe vera gel MCV was higher than at control (0% aloe vera gel, 137.7). MCH values at 10% (146.6) and 20% (145.60) were also significantly higher than the control (0%) treatment (49.00). The result indicated that aloe vera gel has no effect on Hb and RBC however, at 10% and 20% influence blood WBC, MCV, MCH and MCHC values.

Keywords: Aloe vera gel, Noiler, Cocks, Hematology.

INTRODUCTION

Noiler is a dual purpose breed of chicken developed in Nigeria by a noble hatchery with the sole aim of addressing the challenges of animal food insecurity and also to solve problems of financial challenges especially of rural communities and small holder farmers as Noiler production is highly profitable and can easily substitute local chicken (Ibrahim *et al.*, 2020).

Resistance of pathogenic microorganism to drugs frequently used as feed additives in poultry production has made scientists to focus on medicinal plants (Aloe vera, Neem, Mulberry leaves etc.) to improve nutritional and health status of poultry (Nuhu *et al.*, 2020). Aloe is a cactus like perennial herbaceous plant which grows easily in arid warm regions of Africa, North America, Europe and Asia (Khojasteh *et al.*, 2016). Aloe gel has been used as antibiotics, wound healing, anti-inflammatory anti coccidial and anti-ulcer agent. Several studies have shown antimicrobial properties of herb extract which can improve intestinal micro flora population an enhance health of poultry digestive system through reduction in number of diseases causing bacteria (Islam *et al.*, 2017).

Blood conveys different feed components to different parts of the body that could influence normal body function and affects health, growth, maintenance and reproduction of the animals (Ibrahim *et al.*, 2016). The study was intended to determine the effect of aloe vera gel on blood parameters of Noiler cocks.

MATERIALS AND METHOD

Location

The study was conducted at the Teaching and Research Farm of Federal Polytechnic Bauchi, Nigeria. Bauchi is on latitude 100C 27'North, 90c 49'East at an altitude of 690.2 meters above sea level (Zaharaddeen *et al.*, 2005).

Experimental Birds and Management

A total of twelve apparently healthy Noilers cocks, with an average weight of 4.3kg were used for the present study. The cocks were obtained from back yard poultry farmers in Bauchi metropolis. They were individually housed single in a well-ventilated cage. They were fed a commercial grower diet. Fresh water was given, medical care such as deworming and broad spectrum anti-biotic were provided during the adjustment period. The twelve cocks were weighed and randomly divided into three treatments (i.e. four cocks per treatment). The control group (T1) were provided with plain water while treatment T2 and T3 were provided with 10 (10%) and 20ml (20%) aloe-Vera gel per litre of water respectively.

Preparation of Aloe Vera Gel Infusion

Aloe Vera gel infusion was prepared according to method of Durrani *et al.* (2008). Fresh aloe Vera was collected from garden for extraction of the gel. The extraction from the leaf was done manually by making a cut, using a small knife. Latex of the leaf was removed and gel was collected in a beaker. The 10% and 20% concentration infusion were prepared by mixing 100g and 200g of fresh gel in a glass bottle and one litre of boiled water at room temperature was shaken for 5-7 minutes to ensure thorough mixing and was then kept for 6-8 hours at room temperature prior to usage.

Blood sample collection

Blood samples were collected from the brachial vein near the *junctura cubiti*. Blood was stored in an Ethylene Di-amine Tetra Acetic Acid (EDTA) tube for haematological examination and two thin blood smears were prepared directly from blood at the venipuncture site without anticoagulant.

Packed Cell Volume (PCV) was determined by duplicate capillary tube blood samples that were centrifuged at 12000g in a Microhaematocrit Centrifuge (Hawksley MHC) and read with a Hawksley haematocrit reader. Enumeration of erythrocytes was carried out by diluting blood 1:101 in a red blood cell pipette with Natt Herrick solution and counting the number of Red Blood Cells (RBC) using an improved Neubauer haemocytometer (Fudge, 2000). Haemoglobin (Hb) was determined using a spectrophotometer at 540nm using the Drabkin's solution as previously described. This facilitated the calculation of erythrocyte indices, Mean Corpuscular Haemoglobin Concentration (MCHC); Mean Corpuscular Value (MCV); Mean Corpuscular Haemoglobin (MCH) using standard formulae.

$$\begin{aligned} \text{MCV} &= \frac{\text{PCV}}{\text{RBC Count in } 10^6/\text{mm}^3} \times \frac{10}{1} \\ \text{MCH} &= \frac{\text{Hb (g/dl)}}{\text{RBC (in } 10^6/\text{mm}^3)} \times \frac{10}{1} \\ \text{MCHC} &= \frac{\text{Hb (g/dl)}}{\text{PCV (\%)}} \times \frac{100}{1} \end{aligned}$$

Statistical analysis

The data were subjected to analysis of variance in a completely randomized design using SPSS software (ver.20.0 for windows, IBM SPSS). Means were compared for significance of differences by Duncan multiple range test (Duncan, 1955).

RESULTS AND DISCUSSION

Table 1 showed hematological values of Noiler chicken fed different levels of aloe vera gel. Hematological indices are an index and a reflection of the status and condition of the blood available for an animal to meet its physiological, biochemical, and metabolic necessities (Ibrahim *et al.*, 2020). There was no significant difference ($P>0.05$) in terms of Hb values across the treatments. The Hb values obtained in the present study were higher than the values of 11.13%, 10.33% and 11.54% reported by Ibrahim *et al.*, (2020) for three strains of Noiler chicken. However, the values were within the normal range of 12.20 to 20.00g/dl for birds as reported by Adedibu *et al.*, (2014). The hematocrit was significantly higher ($P<0.05$) in control (0% aloe vera gel) than 10 and 20% aloe vera gel inclusion levels. The WBC values were significantly ($P<0.05$) higher at 20% aloe vera gel than aloe free treatment (0%). There was no difference ($P>0.05$) among RBC values which were statistically higher in control than in 10% Aloe vera gel treatment. The values obtained were within the range of 2.1 and $5.5 \times 10^{12}/\text{l}$ as REFERENCE for avian species (Adedibu *et al.*, 2014). This is an indication that all the birds were healthy. The MCV and MCH values for 10 and 20% aloe vera gel were significantly

($P < 0.05$) higher than the aloe vera free treatment. The MCV values were similar to 147.87 ± 18.43 fl for Thai cock as reported by Simaraks *et al.*, (2004). The MCHC value for 10% aloe vera gel was higher ($P < 0.05$) than aloe vera free (0%) and 20% aloe treatments.

Table 1: Blood Parameters of Noiler Cocks fed Aloe vera gel.

Treatments	HB	HCT	WBC	RBC	MCV	MCH	MCHC
0% Aloe Gel	16.15	44.65 ^a	285.20 ^b	3.18	140.55 ^b	50.80 ^b	36.60 ^b
10% Aloe Gel	15.10	40.40 ^b	292.45 ^{ab}	2.63	146.60 ^a	54.75 ^a	37.35 ^a
20% Aloe Gel	14.75	40.60 ^b	299.45 ^a	2.79	145.60 ^{ab}	52.90 ^{ab}	36.35 ^b
SEM	0.53	1.20	2.35	0.13	1.61	0.89	0.28

Values within each column with different superscripts differ significantly at $P < 0.05$

The result indicated that aloe vera gel has no adverse effect on Hb and RBC however, at 10% and 20% influence blood WBC, MCV, MCH and MCHC values. The high level of the WBC implies that the gel has given the cocks ability to generate more antibodies, have high degree of resistance to disease and enhance their adaptability to the environment while MCV, MCH and MCHC indicates adequacy of red blood cells which is essential for metabolism (Simaraks *et al.*, 2004).

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