HAEMATOLOGICAL PARAMETERS OF KANO BROWN BUCKS FED DIETS CONTAINING GRADED LEVELS OF *Piliostigma thonningii* (KARGO) LEAVES IN SEMI – ARID REGION OF NIGERIA

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ABSTRACT
The study was conducted to evaluate the effects of feeding different inclusion levels of Piliostigma thonningii leaves on haematology of Kano Brown bucks. Sixteen (16) growing Kano Brown bucks weighing averagely 10 – 12 ± 2kg were randomly allocated to four treatments in a Completely Randomized Design (CRD) with four (4) replications per treatment. Four (4) diets containing P. thonningii leaves at 0, 15, 30 and 45% were fed at 3.5 kg/ body weight/day for a period of 84 days. The results of heamatological parameters showed no significant (P>0.05) differences in all parameters except for packed cell volume (PCV). It was concluded that inclusion level of P. thonningii leaves has no deleterious effects on haematology of Kano Brown bucks. It was therefore, recommended that, P. thonningii leaves could be included up to 45% level in the diet of Kano Brown bucks.
Keywords: *Piliostigma thonningii,* Haematology, Inclusion, Levels, Bucks

INTRODUCTION

Nutritional composition of the plant plays a significant role in nutritional, medicinal and therapeutic values (Al-Kharusi *et al.,* 2009). In animals, nutrition plays a major role in animal's ability to overcome the detrimental effects of parasitism and diseases (Anwar *et al.,* 2007). A well-nourished animal resists disease even when exposed to infection than the one, which is already weakened through malnutrition (Mayo *et al*, 2011). Blood parameters have been considered as the major indices of physiological, pathological and nutritional status of an animal. Therefore, metabolic state of an animal and the quality of feed could be an explanation for changes in blood constituents compared to normal values (Iliyasu *et al*, 2022). When an animal is exposed to pathogens, the animal's immune system mounts a response to fight off infectioni *(*Mayo *et al;* 2011*)*. This includes raising antibodies to fight the infection, as well as using white blood cells to attack pathogens (FAO, 2002). *Piliostigma thonningii* is one of many browse species whose leaves are consumed by different species of herbivorous animals in the arid and semi-arid zone of the world. *Piliostigma thonningii* known locally as 'Kargo' or 'Kalgo' is one of the medium-small size leguminous shrub that grow in the tropics. It is well-known browse specie in Northern Nigeria (Akin-Osanaiye *et al.,* 2009). *Piliostigma thonningii* (Kargo) is regarded as a plant with good fodder value in the Northern part of Nigeria and other parts of the arid and semi-arid areas of tropical and sub-tropical Africa (Iliyasu *et al*., 2019). Animal productivity could be enhanced by providing forages that are good and qualitative. Therefore, the study aimed at evaluating the effect of fedding Kano Brown bucks different inclusion levels of *Piliostigma thonningii* (Kargo) leaves on heamatology.

MATERIALS AND METHODA

Study area

The study was conducted at Kano University of Science and Technology Teaching and Research Farm Wudil, Kano State. It is located in the Sudan savanna vegetation zone of North-Western Nigeria and it lies within latitude $12^0$58'N and longitude $8^0$25'E on altitude of 408m above sea level. The climatic condition is characterized by low relative humidity with an annual rainfall of 890mm (occurring between May and October with a peak in August) and an annual temperature range of 38 - 43^0C (Olofin *et al.*, 2008).

Proximate composition of the experimental diets.

Representative samples of *Piliostigma thonningii* leaves (Kargo), experimental diets and faeces were analyzed for proximate composition (dry matter, crude protein, crude fiber, ether extract, ash and nitrogen free extract) according to AOAC (2005) procedures.

Experimental Design and Treatments

The experimental animals were randomly allotted to four (4) treatments with four (4) replications per treatment in a completely randomized design (CRD).

Statistical analysis

The collected data were analyzed using analysis of variance (ANOVA) procedures of the Statistical Analytical Systems (SAS, 2009) software package version 9.2 and the means with significant differences were separated using Least Significant Difference (LSD) at 5% level of probability (P<0.05).

RESULTS AND DISCUSSIONS

Proximate composition of experimental feeds

The results for proximate composition of experimental diets and experimental material were presented in Table 2. The values of dry matter, crude protein, crude fibre, ether extract, Ash and nitrogen free extract obtained in this study were 95.56%, 11.61%, 25.23%, 3.09% 7.43% and 52.64 respectively. The values of DM, CP and CF obtained in this study were higher than values (92.50%, 11.49%, and 21.48% respectively) reported by Iliyasu *et al.* (2019) for *P. thoningii* leaves in semi-arid region in Nigeria. However, the values of EE, Ash and NFE obtained in this study were lower than values (5.75%, 9.55% and 56.74% respectively reported by Iliyasu *et al.* (2019) for *P. thoningii* leaves in semi-arid region in Nigeria. The variations possibly occurred due to maturity stage and time when sample of test material was collected. Proximate composition of experimental diets, the values of dry matter varies from 94.30 - 94.88% with T_4 having the higher value. Crude protein values ranged from 12.17 - 13.63% with T_2 having the higher value. The Crude fibre content varies from 18.18 - 24.04% and T_4 reported higher value. Ether extract varies from 4.26 - 4.62% with T_2 observed to have highest value. An ash content range from 7.44 - 11.81% with T_2 having higher value. Nitrogen free extract (NFE) content varies from 50.70 - 53.07% with T_1 recorded highest value.

Table: Proximate composition of the experimental diets

	Inclusion levels of P.T.L(%)				
Parameters (%)	**(0)**	**(15)**	**(30)**	**(45)**	**PTL**
Dry matter	94.30	94.43	94.68	94.88	95.56
Crude protein	13.28	13.63	12.76	13.44	11.61
Crude fiber	18.86	18.18	20.97	24.06	25.23
Ether extract	4.26	4.62	4.39	4.38	3.09
Ash	10.53	11.81	10.49	7.44	7.43
Nitrogen free extract	53.07	51.76	51.39	50.70	52.64

P.T.L= *Piliostigma thonningii* leaves

Haematological parameters by Kano Brown Bucks fed varying Inclusion Levels of *Piliostigma thonningii* leaves.

The results of haematological parameters of Kano Brown bucks fed *Piliostigma thonningii* leaves shows there were no significant (P>0.05) differences in all parameters except packed cell volume (PCV). Animals on T_2 (15%) had significantly (P < 0.05) higher values of haemoglobin, mean corpuscular volume and mean corpuscular haemoglobin concentration.

Table 2: Haematological parameters by Kano brown bucks fed different inclusion levels of *Piliostigma thonningii* leaves

	Inclusion level of P.T.L (%)					
Parameters	**(0)**	**(5)**	**(10)**	**(15)**	**LSD**	**Normal values***
Hb (g/dl)	10.20	10.17	9.34	10.08	1.132	8 – 12
PCV (%)	28.57^{a}	25.97^{b}	24.18^{b}	27.15^{a}	2.94	22 – 38
RBC ($\times 10^{12}$/l)	6.54	6.46	5.35^{b}	6.94	4.22	8 – 18
WBC ($\times 10^{9}$/l)	11.48	11.27	11.62	11.43	0.70	4 – 13
MCV (fl)	36.07	36.32	33.04	35.37	6.83	26 – 40
MCHC (g/dl)	33.14	33.17	33.20	33.03	4.56	30 – 36
MCH (pg)	37.8^{a}	32.09^{ab}	29.83^{b}	32.40^{ab}	3.99	26 – 40

[abc] Means within the same row with different superscript differs significantly (P<0.05) LSD least significant difference, HGB = haemoglobin, PCV = packed cell volume, RBC = red blood cell, WBC = white blood cell, MCV = mean corpuscular volume, MCH = mean corpuscular heamoglobin, MCHC = mean corpuscular haemoglobin concentration. P.T.L= *Piliostigma thonningii* leaves * Source: the Merck Veterinary Manual (2016)

But statistically the values of Hb and MCV were similar. While red blood cell and white blood cell were significantly ($P< 0.05$) higher in T_4. T_1 was significantly ($P< 0.05$) higher in packed cell volume, but statistically similar with all treatments' values. The values obtained for haemoglobin were within the normal range (5-12g/dl) for goats (The Merck, 2016). Haemoglobin is the essential carrier of Oxygen in and out of cell and may be deficient in Anaemia. Therefore, the animals were not anaemic as suggested by the result of present study. Packed cell volume Concentration obtained in this study were within the range values reported by Oni *et; al* (2012) for goats. From the result, the animals might have produced more White Blood cells in response to the nutritional adequacy of the diets. Since none of the animal suffered from an excessive reduction to the number of white blood cell, it appears that feeding *Piliostigma thonningii* leaves did not affect the immune status of the animals because the white blood cell functions.

CONCLUSION

It can be concluded that *Pilliostigma thonningii* leaves can be included up to 45% in the diets of Kano Brown bucks without adverse effect on the haematology.

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