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HEMATOLOGICAL PARAMETERS OF WEST AFRICAN DWARF RAM FED *FICUS SYCOMORUS* AND *CROTALARIA RETUSA* LEAF MEAL

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ABSTRACT

The study was conducted to evaluate the chemical composition and hematological parameters of West African Dwarf (WAD) Rams fed Ficus Sycomorus and Crotalaria retusa. *Four isonitrogenous diets with 16% Crude Protein (CP) were formulated to contain Ficus sycomorus and Crotalaria retusa leaf meal at ratios of 0:30, 10:20, 20:10 and 30:0 of Ficus sycomorus:Crotalaria retusa, representing the four different treatments. The experimental design was* a completely randomized design with four animals per treatment.*The chemical composition of diets during the study shows that parameters across the treatments were significantly affected (P<0.05).* The haematological parameters: Packed cell volume (PCV), haemoglobin (Hb), red blood cells (RBC), white blood cells (WBC) and Mean corpuscular volume (MCV) were significantly different (P<0.05) among the treatments. However, the haematological values fall within the normal range and hence the animals are deemed safe at the end of the trial.

Keywords: Haematology,Chemical composition, Ficus sycomorus, Crotalaria retusa, WAD ram,

INTRODUCTION

One of the major bottlenecks limiting productivity of livestock in Nigeria is inadequate supply and poor quality of feeds. This problem is even more aggravated in arid and semi-arid areas given the erratic and unreliable rainfall pattern. In Nigeria, the farming system follows the trend examined by Agbede and Ibitoye (2007) in which process of intensification continue to gain popularity through mixed crop livestock system, particularly, among the smallholder farmers due to scarcity of land resources and increased demands for agricultural produce and animal protein (Abdu *et al.,* 2012). Blood is an important index of physiological and pathological changes in an organism (Mitruka and Rawnsley, 1977). Blood examination is performed for screening procedure to assess general health (Aengwanich *et al*., 2009) and the body's ability to fight infection (Aengwanich *et al*., 2009). The primary function of the blood is to transport oxygen from respiratory organs to body cells (Duke, 1975) distribute nutrients and enzymes to cells and carry away waste products (Baker and Silverton, 1982) thereby maintaining homeostasis of the internal environment (Bentrick, 1974). The various functions of the blood are carried out by the individual and collective actions of its constituents – the haemotological and biochemical components (Akinmutimi, 2004). The information gained from the blood parameters would substantiate the physical examination and together with medical history provide excellent basis for medical judgment (Aengwanich *et al*., 2009). This study was therefore an attempt to determine the haematological values of WAD rams fed *F. sycomorus* and *C. retusa*.

MATERIALS AND METHODS

Experimental location

The experiment was carried out at the Sheep and Goat unit of the Teaching and Research Farm of the Oyo State College of Agriculture and Technology, Igboora.

Experimental diet

The *Ficus sycomorus* and *Crotalaria retusa* leaves used for this study was collected from the Oyo State College of Agriculture and Technology, Igboora, Oyo State. The leaves were air dried on a concrete floor in a well ventilated room for seven days and later stored in jute bags at room temperature until the commencement of the study. Four isonitrogenous diets with 16% CP were formulated to contain *Ficus sycomorus* and *Crotalaria retusa* leaf meal at ratios of 0:30, 10:20, 20:10 and 30:0 ratio of *Ficus sycomorus*:*Crotalaria retusa*, representing the four different treatments..

Table 1: Composition of the Experimental Diets (%)

Ingredient	T1 0:30	T2 10:20	T3 20:10	T4 30:0
Maize	44.40	45.17	47.87	49.21
F. sycomorus	0.00	10.00	20.00	30.00
C. retusa	30.00	20.00	10.00	0.00
Groundnut cake	12.60	11.83	9.13	7.79
Wheat offal	10.00	10.00	10.00	10.00
Bone meal	2.00	2.00	2.00	2.00
Salt	1.00	1.00	1.00	1.00
Total (%)	100.00	100.00	100.00	100.00

Experimental animals

Twelve (12) clinically healthy West African Dwarf rams sourced from different herds, about 5 months old with 10±12 kg mean initial body weight (BW), were randomly assigned to the four dietary treatments in a completely randomized design for a period of 77 days. Prior to the commencement of the experiment, the rams were prophylactically treated against ecto-parasites by using Diasuntol® and were also treated against infections using oxytetracycline LA® at the rate of 1ml per 10kg body weight per animal.

Haematological Studies

The WAD rams were bled through jugular vein and 5 ml of blood collected: the blood samples was collected into plastic tube containing Ethylenedianmine tetraacetic acid (EDTA) for haematological studies.

Statistical analysis

Data were subjected to analysis of variance for a completely randomized design using SAS (2004) software products, USA) with the following model: $Yij = \mu + Fi + eij$ Where *Yij* is the dependent variable; μ the general mean; Fi the effect of the ith treatment; and *eij* the residual error. Treatment comparisons were made using planned non-orthogonal contrasts. Significant differences were declared if $P < 0.05$.

RESULTS AND DISCUSSION

Result for chemical composition of diets during the experimental study showed that parameters across the treatments differed significantly ($P<0.05$). T3 had the highest value for dry matter (94.88%) and T1 had

the lowest value (92.67%). T1 had highest value for crude protein (17.36%) and highest value of crude fiber (14.21). T4 had lowest value for crude protein and crude fiber respectively (16.89% and 12.11%). T1 had the highest value of ether extract (3.58%) while T2 had the lowest value of ether extract (2.96). These values of dry matter are higher than the range 71.82% to 87.09% reported by Yashim *et al*. (2014). The crude protein value of the study diets ranges from 16.89% in 30:0 ratio to 17.36% in diet containing 0:30 ratio of *F. sycomorus*:*C. retusa*. The crude protein values of *F. sycomorus* were 12.56% while that of *C. retusa* were 12.31%. These values of crude protein of *F. sycomorus* are similar to 12.99% reported by Yashim *et al*. (2014) and the values of *C. retusa* in the present study are lower than 14.23% reported by Yashim *et al*. (2012). The Crude Protein content of *Ficus sycomorus* leaf in this study (12.56%) are however lower than the 14.90% reported by (Njidda, 2010). The differences observed could be attributed to stage of harvest, differences in soil and environmental factors. The Neutral Detergent Fibre and Acid Detergent Fibre content in the study diets increase with increased in the ratio of *Ficus sycomorus* leaf meal (0% to 30% ratio). The Neutral Detergent Fibre level was lower in this study than the safe upper limit of 60% reported by Meissner *et al*. (1991) for guaranteed feed intake by ruminants. Haematological values are presented in Table 2. There were significant differences ($P<0.05$) among treatments. The haemoglobin (Hb) values ranged from 9.00 to 14.00 g/dl. The results of the red blood cell count (RBC) showed no significant effect ($P>0.05$) among treatments. There was significant effect ($P<0.05$) for white blood WBC-. The PCV value obtained in the present study was higher than the range 25.7 + 3.1 reported by Njidda *et al*. (2013) for Red Sokoto goats. The increase in PCV might be attributed to increase in environmental temperature which was similar to the observation made in this study. In general, increase in Hb concentration is associated with greater ability to resist disease infection, and low level is an indication of disease infection and poor nutrition (Njidda *et al*., 2013). The result of RBC value obtained in this study is close to the values reported by Njidda *et al*. (2013). The reduction in PCV, Hb and RBC values may be attributed to hyperactivity of the bone marrow, leading to the production of red blood cells with impaired integrity which was easily destroyed in circulation by recticulo- endothelial system. Shakoor *et al*. (1992) suggested that decrease in RBC counts is either an indication of excessive damage to erythrocyte or inhibition of erythrocytes formation... Egbe-Nwiyi *et al.* (2000) reported that the higher leucocyte count (WBC) is an indicator of immune response to infections or toxic substances in the organism and a low count is an indication of pathogenic infection or presence of antigens in the organism Bradbury *et al*., 1999).

CONCLUSION

From the results of the study, it can be concluded that the haematological parameters for WAD rams were within normal range. Thus, WAD rams can be fed diets with up to 30% inclusion of *Ficus sycomorus* and *Crotalaria retusa* without adverse effects on their blood parameters.

Table 1: Chemical composition of supplementary diets, Ficus sycomorus and Crotalaria retusa meal

Parameter (%)	T1 0:30	T2 10:20	T3 20:10	T4 30:0	Ficus leaf	Crotalaria leaf
Dry matter	92.67	93.13	94.88	93.50	89.56	98.30
Crude Protein	17.36	16.98	17.04	16.89	12.56	12.31
Crude fibre	14.21	12.80	13.11	12.11	18.19	22.86
Ether extract	3.58	2.96	3.29	3.13	4.42	0.72
NFE	61.59	63.13	62.07	64.35	61.61	58.08
Ash	3.26	4.13	4.81	3.38	7.22	5.02
NDF	34.61	37.50	37.73	38.88	63.81	64.02
ADF	18.00	20.75	21.05	21.42	33.94	34.21
Lignin	7.84	8.69	7.01	8.47	17.02	17.83

Table 3: hematological parameters of WAD rams fed *Ficus sycomorus* and *Crotalaria retusa* meal

Parameter (%)	T1 0:30	T2 10:20	T3 20:10	T4 30:0	SEM
PCV	28.00[c]	42.00[a]	38.00[b]	27.00[c]	1.21
Hb	9.30[c]	14.00[a]	12.70[b]	9.00[c]	0.81
RBC	7.50[b]	9.50[a]	6.70[c]	6.10[c]	1.71
MCV	37.30[c]	44.20[b]	56.70[a]	44.30[b]	0.62
WBC	8.20[c]	14.40[a]	7.80[c]	10.20[b]	1.2

[abcd] means within the same row with different superscript differ (P<0.05)

PCV: Packed cell volume, MCV: Mean corpuscular volume, Hb: Haemoglobin , RBC: Red blood cell, WBC: White blood cell

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