NIGERIAN AGRICULTURAL JOURNAL
ISSN: 0300-368X
Volume 52 Number 2, August 2021 Pg. 367-376
Available online at: http://www.ajol.info/index.php/naj
https://www.naj.asn.org.ng

PERFORMANCE AND HAEMATOLOGICAL PARAMETERS OF YANKASA SHEEP FED *Ficus sycomorus* AS SUBSTITUTE TO GROUNDNUT CAKE

[1]Njidda, A. A., [2]Al-Habib, I. K. and [3]Oloche, J.

[1]Department of Animal Science and Fisheries, National Open University of Nigeria, Km4, Kaduna-Zaria Road, Rigachukun, Kaduna State, Nigeria
[2]Department of Animal Production, University of Agriculture, Makurdi, Nigeria
[3]College of Agriculture and Animal Science, P.M.B. 2134, Ahmadu Bello University, Zaria Mando, Kaduna
Corresponding Authors' email: ahmednjidda7@gmail.com

Abstract
The effect of replacing groundnut cake (GNC) with *Ficus sycomorus* foliage on the performance of Yankasa rams was studied. Sixteen (16) Yankasa rams with an average weight of 14.25 ±0.2kg were divided into four groups with four animals per group. Each group was randomly assigned to the four dietary treatments in a completely randomized design (CRD). The diets compared were 0% (Control), 5%, 10%, and 15% *Ficus sycomorus* levels of inclusion designated as T_1, T_2, T_3, and T_4 respectively. Result shows significant ($P<0.05$) differences in all the parameters studied for chemical composition of the experimental diets. The control had the highest values for dry matter (DM), cellulose, acid detergent fibre (ADF) and neutral detergent fibre (NDF) each. The body weight gain, dry matter intake (DMI) and metabolic weight were higher for the 10% inclusion than other treatment groups. The nutrients digestibility were significantly ($P<0.05$) affected by the substitution level. Dry matter (DM) and the fibre fraction digestibility were generally low. Nitrogen intake and Nitrogen retained as % Nitrogen intake were not significantly ($p>0.05$) affected by the substitution level. The results showed no significant ($p>0.05$) effect on the haematological parameters except for the white blood cell differentials (Lymphocytes, Neutrophils and Monocytes) which showed significant differences ($p<0.05$) among treatment groups. Serum metabolites results were significantly ($p>0.05$) not affected by the substitution level, except for urea, protein, globulin and alkaline phosphatase; which showed significant ($p<0.05$) difference among treatments. Results therefore, show that *F. sycomorus* can be used to substitute groundnut cake; though decrease in fibre digestibility should be taken into consideration, and the best level of substitution was 10% for *F. sycomorus*.

Keywords: Browse, *Ficus sycomorus*, sheep, haematology, digestibility, performance

Introduction

Small ruminants form an integral part of the livestock economy in Nigeria. The arid and semi-arid areas are home to over 80% of small ruminants and their sustenance is reducing due to dependence on natural pastures (Kosgey *et al.,* 2008). They support 46-58% of pastoral households and play a significant role in the food chain and overall livelihoods of rural households, where they are largely owned by women and their children (Lebbie, 2004). Dry season feeding of ruminants in most tropical areas has always been a problem for farmers since little good pasture exists during this period. At this time, the performances of these animals are seriously impaired. One possible way to alleviate this problem and maintain production in the tropics is to feed them with crop residues and browse plants. These feed resources are not consumed by man but can be converted by ruminants into animal products desirable as human food. These therefore, reduce total cost of animal production without a decrease in productivity and also maintain efficient feed utilization. The multipurpose tree (MPT); *Ficus sycomorus* is available in many parts of Nigeria, and grows best on drainage lines, streams, rivers, springs or dams (Bekele *et al.,* 1993; Belete *et al.,* 2016). The fruits of these trees are used for wild animals and birds (Belete *et al.,* 2016). *F.sycomorus* leaf and petioles are well accepted by West African Dwarf lambs and led to higher levels of apparent digestibility than the other tree species (Anugwa and Okori, 1987; Kassa and Mekasha, 2014). Feeding Ficus fodder to lambs is actively encouraged in Nigeria. The MPT leaf (*F. sycomorus*) has been reported to have high nutritive value (Orwa *et al*., 2009). Njidda and Ikhimioya (2010) reported 95.6% DM, 14.90% CP, and 32.5% CF, 3% EE, 18% ash, 54.80% NDF, 33.4% ADF, 12.60 % ADL and 4.49 ME (MJ/kg DM).

Nkafamiya (2010) reported 14.12% moisture, 10.24% ash, 3% lipids, 31.52% CF, and 17.95% CP. The plant is known to have some pharmacological activities (Salvador *et al.,* 2012; Higa *et al*., 1987; Salvador *et al*., 2012; Yan *et al*., 2014), antioxidant (Sheikha *et al*., 2015a and 2015b, Afaf *et al*., 2015), antimicrobial (Sheikha *et al*., 2015a and 2015b, Afaf *et al*., 2015) and cytotoxic activity (Sheikha *et al*., 2015b). The study was therefore designed to evaluate the effects of substituting groundnut cake with *F. sycomorus* leaf on performance haematological profile of Yankasa sheep.

Materials and Methods

Location of the study

The research was conducted at the Kaduna State University Teaching and Research Farm, Kafanchan campus, Jema'a Local Government Area, Kaduna State, Nigeria. The area is located within latitude 9°34′N and longitude 8°17′E. The vegetation of the area is Guinea Savannah and designated as Koppen's Aw climate with two distinct seasons; wet season in summer and dry season in winter. Rainfall occurs between the months of April to October with a peak in August. The mean annual rainfall is about 1800mm and the mean monthly temperature is 25°C, while the relative humidity is about 63% (Ishaya and Abaje, 2008).

Animals and treatments

Sixteen clinically healthy Sheep (rams) about 5 months old with 14.25±0.2kg mean initial body weight (BW) were randomly assigned to one of four dietary treatments in a completely randomized design for a period of 77 days. The dietary treatments compared were: T_1 (received diet containing 0%), T_2 (5%), T_3 (10%), and T_4 fed diet containing 15% *F. sycomorus* as shown in Table 1. The diets were offered twice daily (08.00 and 15.00 hours) respectively in two equal portions.

Metabolism trial

At the end of the feeding trial, 12 rams; equally representing the four dietary treatments were selected at random and transferred to the metabolism cage for the metabolism trial. Animals were allowed to adjust to metabolism crates for 3days prior to the start of the experiment, and were then offered the experimental diets for 10days followed by 4 days of total collection of feed, faeces, and urine. Animals were offered the experimental diets. Total feces and urine voided were collected in plastic buckets; urine buckets contained 10ml of conc. H_2SO_4. Faeces were weighed and urine volume measured and weighed prior to taking a 10% aliquot, and compositing for each animal.

Haematological and Serum biochemical assay

The Rams were bled through jugular vein and 10ml of blood collected. Exactly 3ml of the blood samples was collected into plastic tube containing EDTA for haematological studies. The remaining 7ml of blood samples was deposited in anticoagulant free plastic tube and allowed to clot at room temperature within 3 hours of collection. The serum samples were stored at -20°C for biochemical studies. Total erythrocytic count and total leukocytic counts were determined with the aid of Haemocytometer (Neubaur counting chamber) and Hb concentration was determined by Sahl's (acid haematin) method (Bengamin, 1978). Mean corpuscular Haemoglobin Concentration (MCHC), Mean Corpuscular Haemoglobin (MCH), and Mean Corpuscular Volume (MCV) values were calculated (Jain, 1986). Serum aspartate aminotransferase, serum alanine aminotransferase and alkaline phospatase were analyzed using spectrophotometric linked reaction method (Henry *et al*., 1960). Total protein by the Biuret method according to the procedure of Oser (1979), Albumin by Bromocresol green (BCG) method, serum glucose, creatinine and bilirubin by Peters *et al.* (1982), Sodium ion and potassium ions by flame photometric method. Other biochemical analyses were done using the method described by Ogunsami *et al*. (2002).

Chemical Analysis

Samples of the experimental diets were collected and oven dried at 60°C for 96hrs, ground separately to pass through a 1mm sieve in a Wiley mill and sampled for chemical analysis using the standard methods (AOAC, 2002). Fiber fraction analysis was by the methods of Van Soest *et al*. (1991). Hemicellulose and cellulose were estimated as differences between neutral detergent fiber (NDF) and acid detergent fiber (ADF) and ADF and lignin, each.

Statistical Analysis

Feed intake, digestibility, body weight gain and carcass parameters were subjected to analysis of variance (ANOVA) using the general linear model procedure in SAS soft ware (V9) (SAS, 2002). The association between nutrient intake, digestibility and body weight gain was tested using correlation analysis. Treatment means were separated using least significant difference (LSD). The model employed is expressed thus:

$$Yij = \mu + ti + bj + eij$$

Where, Yij = Response variable, μ = Overall mean ti = Treatment effect, bj = Block effect (initial body weight), eij = Random error

Results and Discussion

Chemical composition of the diets

The results of the chemical composition of the experimental diets are shown in Table 2. There was significant effect ($p<0.05$) for all the parameters studied for the chemical composition. The DM, cellulose, ADF, NDF were observe to be high for diet T_1, and CP content was highest in T_2 (5%) *F. sycomorus*. The NDF values were moderate in all the treatments, likewise the ADF, but the ADL was high for all the treatment groups. The dry matter (DM) content of experimental diets were observed to be high (897.30 to 915.10g Kg^{-1} DM) for all the dietary treatments. The DM content of the diets may be attributed to the high DM content of *F. sycomorus* leaf meal. This was similar with the findings of Njidda *et al.* (2010) and Achi *et al*. (2018) who reported DM content of 956.00 and 895.60g Kg^{-1} DM for *F.*

sycomorus. The CP content of the diets is within the range required for efficient microbial activity in the rumen. Njidda *et al.* (2010) and Njidda *et al.* (2013c) reported that browse plants such as *Ficus polita, Ficus thonningii and Khaya senegalensis* had above 13% CP content which is an indicator that most tropical browse species are high in CP content and can be used to supplement poor roughage to increase productivity for ruminant livestock in tropical regions. The *F. sycomorus* leaf meal used in this study had lower (172.26 g Kg^{-1} DM) crude fibre (CF) content compared to the 325.00g Kg^{-1} DM reported by Njidda (2011) and 181.90g Kg^{-1} DM reported by Achi *et al.* (2018). One of the characteristics of most browse leaves is that they have relatively high CF value which could be attributed to the high cell-wall constituents usually present in the leaf meal as this is indicated in the high fibre content of the diets. The NDF, ADF and ADL values of the experimental diets were higher than earlier reports on the tropical forage species (Njidda 2008, Njidda *et al.* 2012a; Njidda *et al.* 2012b and Njidda *et al.* 2016). Difference in compositions may be due to variation in age, environmental and soil conditions and climatic factors. Although the NDF was slightly higher than the recommended value of 20–35% for effective ruminal degradation (Norton 1994; Bakshi and Wadhwa 2004; Njidda *et al.* 2013b); it was lower than 60% value at which feed intake is depressed (Meissner *et al*., 1991).

Performance characteristics

Dry matter Intakes of the diets were greater ($P < 0.05$) for T_2 than the other treatment groups, likewise the weight gain and metabolic mass ($P < 0.05$). Intakes of DM (Kg day^{-1}) relative to the control and the treatments receiving *F. sycomorus* diet had effect ($p<0.05$) on feed gain ratio (Table 3). The DMI was significantly ($P<0.05$) different across treatments. Animals fed diets T_3 (10% inclusion of *F. sycomorus*) had significantly ($P<0.05$) higher DMI (3.25kg day^{-1}), while those on 5% inclusion level had the lowest (2.26kg day^{-1}). The high DM intake observed in T_3 was probably due to better balance between energy and protein as more organic matter was consumed from the leaves. Lawan *et al.* (2008) also reported that supplements containing more degradable protein enhance complete utilization of structural carbohydrates in the ingested forage. Final weight and total weight gain was significantly ($P<0.05$) influenced by the levels of *Ficus sycomorus* in the diet. Animals fed diets T_3 FSLM at 10% inclusion level had highest (8.62kg) weight gain, each, while those on 5% inclusion levels recorded the least values statistically. Final weight and total weight gain was significantly ($P<0.05$) influenced by the levels of *Ficus sycomorus* in the diet. Animals fed diet T_3 FSLM at 10% inclusion level had highest (22.97 and 8.62kg) final and total weight gain, respectively, while lower values were obtained for those on 0, 5 and 15% levels of *F. sycomorus* levels of inclusion. The ADG varied from 0.03 to 0.10kg day^{-1} with T_2 having the lowest (0.03kg day^{-1}) ADG; suggesting a low efficiency in utilization of the experimental diet. Almost all literature on the use of shrub and tree fodders to supplement either natural grasses or crop residues have shown positive responses with respect to the productivity of cattle, sheep and goats (Norton, 1998). However, among the supplemented group, sheep in T_3 performed significantly better ($P<0.05$) than sheep in T_2 and T_4. Inclusion of *F.sycomorus* also significantly increased ($P<0.001$) FCE and FBW of sheep on diet T_3 compared to other treatment groups. Adebowale *et al.* (1991) reported that low degree of digestion coupled with low passage rate through the alimentary tract limit net energy availability for production. Though the inclusion of *F. sycomorus* (T_2-T_4), sheep, significantly ($P>0.01$) differed in these parameters. Supplementing MPT to small ruminants improved growth performance as documented earlier (Reed *et al.*, 1990; Njidda and Ikhimioya 2010; Kassa and Mekasha., 2014). It has been reported that fodder trees would be good protein supplements for ruminants, provided that they are degraded adequately in the rumen to make the protein available to the animal and non-toxic (Leng, 1997). Anugwa and Okori (1987) reported that, West African dwarf lambs gained 71g/day over a 14-day period when fed a sole diet of *F. elasticoides* foliage. However, the *F. sycomorus* leaf in the present showed positive body weight change, possibly due to sufficient supply of protein. Generally, supplementing with MPTs like *F. sycomorus* leaf, BW gain of sheep at 10% level of inclusion; probably either by providing nutrient available for absorption or by enhancing microbial protein synthesis. Though there has not been exhaustive study conducted on *F. sycomorus* in Nigeria on one hand and Yankasa sheep on the other.

Apparent nutrient digestibility

The nutrients digestibilities were generally low for all the nutrients compared to other reports, with more adverse effects on the fibre fractions. The CP and EE had low to moderate digestibility with higher values in T_3. Animals on diet T_3 were observed to have better digestibility ($p < 0.05$) values compared to other treatment groups (Table 4). The lower DM digestion coefficients observed for all the treatments could be due to the relatively higher fiber fraction contained in the diets. However, among supplemented group, the apparent digestibility coefficient of CP and EE were significantly higher ($P<0.01$) for T_3 compared to T_2 and T_4. The digestibility coefficient of CP was significantly higher ($P < 0.001$) for T_3, followed by T_3, T_4. The finding is in agreement with McDonald *et al.* (2002) who reported that higher CP intake is associated with better CP digestibility. There is no significant difference ($p<0.05$) between, T_2 and T_4 in CP digestibility. The DM digestibility of the supplemented group in the present study is comparable with 75.8-80% reported by Tegbe *et al.* (2005) in West African dwarf goats fed basal diet of *Panicum maximum* and supplemented with *M. indica*, *F. thonningii*, *G. sepium* leaf and concentrate. Similarly, dry matter digestibility (DMD), which is related to nutrient composition, varied widely among tree and shrub species. Anugwa and Okori (1987) also reported that the fresh Ficus leaf and petioles were well accepted by West African dwarf lambs and led to higher levels of apparent digestibility than the other tree species, ranging from 70.1% for crude fibre (CF) to 81.8% for crude protein. Ahn *et al.* (1989) and Njidda (2013a) indicated that drying of MPT leaf decreased tannin content and showed increase in digestibility of protein from 64-84%. McSweeny *et al.* (2001) also reported that tannins could reduce fibre digestion by complexing with lignocelluloses and preventing microbial attachment and degradation, or by directly inhibiting cellulotic microorganisms, or both. A low level of CP (less than 80g kg^{-1} DM) is shown to depress digestibility (T_2), as it is not sufficient to meet the needs of the rumen bacteria (Norton, 1998). Lignification of the plant cell wall decreased the digestibility of plant material in the rumen. Bakshi and Wadhwa, (2004) also reported that high NDF and ADL depressed DM intake DM digestibility.

N use efficiency

N intake and retention were greater ($P < 0.05$) for the 15% *F. sycomorus* inclusion. N in urine and N absorbed were significantly ($p<0.05$) higher for T_2 (5% *F. sycomorus* inclusion) than the control diet. Urine, absorbed, retained and N absorbed as percent N intake was greater ($P < 0.05$) for T_2 than the other treatment groups (Table 5**).** The nitrogen utilization trial showed a significant ($P<0.05$) effect among dietary treatments. Nitrogen (N) intake and Urinary N of sheep on T_2 (16.38 and 1.25 g/day) were significantly ($P>0.05$) higher than the other treatment groups. Yankasa rams receiving *F. sycomorus* inclusion in their diets had higher N retention compared to the control group receiving 0% *F. sycomorus.* Abdu *et al.* (2012) had similar observation when *F. sycomorus* was included in Yankasa rams diets. The urinary N output was significantly ($P<0.05$) influenced by the dietary treatment groups, with sheep on T_2 (1.25 g/day) being the highest output, and T_3 (0.58 g/day) being the lowest. Nitrogen balance (g/day) was significant ($P<0.05$) among the dietary treatments. The findings of an increased N balance in Yankasa rams is consistent with the findings of Silva *et al.* (2004), who reported higher level of N retention in sheep fed forage based diets but also observed an increased DMI and CP intake (g kg^{-1} $W^{0.75}$) in ram lambs. These authors suggest a higher utilization of recycled N as a mechanism for the improved N balance. N retention is considered a better criterion for measuring protein quality than digestibility. N retention is associated with the amount of N used for protein deposition and biological value is a measure of protein quality (Silva *et al.,* 2004; Wildeus *et al.*, 2007). The browse forage offered gave a positive N balance. This demonstrated that the browse forages were efficiently used as fermentable N source for microbial growth in the rumen. The values for the N balance were higher than the values (1.50 to 7.69 g day^{-1}) reported by Wampana *et al.* (2008) who fed agro-industrial by-product and also higher than the values (0.59 to 8.11g day^{-1}) reported by Njidda *et al.* (2018) who fed *Daniellia oliveri* foliage.

Hematological indices

Whereas Hb concentration, MCV, PCV, Lymphocytes and Neutrophils were higher ($P < 0.05$) for T_4, other hematological parameters were similar ($P > 0.05$) among the diets (Table 6). There was significant ($p>0.05$) difference for all the parameters observed except for Hb, MCV, PCV and RBC which shows no significant ($p>0.05$) difference among treatments respectively. The result of the haemoglobin (Hb) value shows that sheep had higher values than other species but the value obtained in this study were within the normal range (9.80 to 12.90g/dl) reported for sheep (Baneejee, 2007 and Njidda *et al.,* 2014). The observed suggest the oxygen carrying capacity of the blood was higher in the experimental animals. Generally, increase in the Hb concentration is associated with greater ability to resist disease infection and low level is an indication of disease infection and poor nutrition (Cheesbrough, 2004; Tambuwal *et al*., 2002; Njidda *et al.,* 2014). The values of MCV, MCHC and MCH significantly increased and are very important in the diagnosis of anemia and also serve a useful index of the capacity of the bone marrow to produce red blood cells (Awodi *et al*., 2005). The increase in MCV, MCHC and MCH are greatly influenced by age and sex (Egbe-Nwiyi, 2000). The packed cell volume (PCV) obtained in the present study (11.15 to 15.50%) was lower than the normal range (28.47 to 30.25%) reported for sheep (Rusuff *et al*. 1954; Bianca 1955; Baneejee, 2007; Njidda *et al.,* 2014). A decreased PCV generally means red blood cell loss from any variety of reasons like cell destruction, blood loss, and failure of bone marrow production. The RBC values obtained in this study were within the normal values reported by (Campbell *et al*., 2003) but lower than the values reported by Njidda *et al*. (2014). The difference may be due to age, sex breed or nutrition. RBC is a signal of the health status of the animals. The low RBC counts may be associated iron deficiency, internal bleeding, some types of anemia or some vitamin deficiency. The white blood cell differentials (Neutrophils and monocytes) levels are comparable among treatments groups. There was significant ($p>0.05$) influence of diet on lymphocyte count. The value for lymphocytes was higher for T_4 than the other treatment groups. The lymphocytes constituted majority of the WBC counts and the cells increased with age in early life in both sexes of sheep and goats (Egbe-Nwiyi *et al*., 2000). The high lymphocyte counts in the animals in this study are favoured by the findings of Milson *et al*. (1960) and Wilkins and Hodges (1962) and it might be attributed to stress and immune response to the environment (Cole, 1986). The urea level in the study falls within the range (4.4 to 8.9mmol/L) reported by Njidda *et al.* (2014) and 8 to 20mg/dl reported by Banejee (2007) in matured domestic animals and 5.28mg/dl for free ranging desert big-horn sheep. High level of serum urea has been attributed to excessive tissue protein catabolism associated with protein deficiency (Oduye and Adedevon (1976). Serum biochemical indices is used to determine the level of heart attack, liver damage and to evaluate protein quality and amino acid requirements in animals as reported by Harper *et al*. (1979). The values of serum electrolyte of sodium, potassium and chloride ranged from 122.00 to 129.0mmol/L, 4.00 to 4.83mmol/L and 98.50 to

105.00mmol/L, respectively. The values obtained in this study are above the normal range reported by Baneejee (2007) and Njidda *et al.* (2014). The electrolytes are known to regulate osmotic pressure, maintain membrane potentials and acid base balance and transmit nerves impulse. Sodium and potassium deficiency affect the tubes of kidney resulting in inability to concentrate urine (Latimer *et al*., 2004). The result of hydrogen carbonate ions reveals that there was no any adverse effect as a result of inclusion of *F. Sycomorus* up to 15% level of inclusion.

Biochemical profiles

Urea, Total protein, Globulin and ALP showed some level of significance ($p<0.05$) among treatments, while other parameters were not significantly ($p>0.05$) affected by the levels of inclusion of *F. sycomorus* (Table 7). The enzymes AST, ALP and ALT ranged from 11.00 to 14.00 (IU/L), 25 to 39 (IU/L) and 17.00 to 39.00 (IU/L), respectively. Blood metabolites were used to monitor nutrient status and associated muscle mass (creatinine). Differences in N utilization among treatment groups were apparently not of sufficient magnitude to be reflected in blood urea-N concentrations (Kohn *et al*., 2005). Horton and Burgher (1992) observed higher blood urea-N concentrations in growing Katahdin lambs. The creatinine values in the present study were within normal range and differ ($P<0.05$) among treatments. High creatinine is indicative of poor protein and amino acid metabolism that can lead to impaired renal function and cardiac infarction (Gray and Howarra, 1980). Increased creatinine has been associated with tannin toxicosis in cattle consuming tannin-rich oak fodder (Garg *et al*., 1992). The glucose level was observed to decrease with increase in the level of *F. sycomorus*; this follows the same pattern with energy content of the diets. Serum glucose is an indicator of cito metabolism in high energy diets (Coles, 1986). When glucose is lower than the normal range; is an indication of hypoglycemia, while higher levels are indication of hyperglycemia (Olorunnisomo, 2012). The values for total protein concentration obtained were within the range 55.0 to 94.0 g/L reported by Njidda *et al.* (2014). Kamalu *et al*. (1988) and Duke (1955) noted that plasma protein help to transport calcium and phosphorus and other substances in the blood by attachment to the albumin. The albumin level in this study shows that Yankasa sheep had less compared to other Northern breeds of sheep reported by Njidda *et al.* (2014). A reading of albumin less than the normal physical value of albumin usually indicates hypoalbuminemia (Altman, 1979). The result of the ALT, AST and ALP were consistent with the report of Njidda *et al.* (2014). Aminotransferases (AST and ALP) clearly shows that there is a significant ($P<0.05$) influence of these parameters on the experimental animals. AST level is helpful for the diagnosis and following of cases of myocardial infarction, hepatocellular disease and skeletal muscle disorders. In trauma or in diseases affecting skeletal muscles, after a renal infarct and in various haemolytic conditions (Alex and LaVerne, 1983), the concentration of Serum Alanine Aminotransferase in tissues is not nearly as great as for Serum Aspartate Aminoferase. It is present in moderately high concentration in liver, but is low in cardiac and skeletal muscles and in other tissues. Their use for clinical purposes is primarily for the diagnosis of liver diseases (DeRitis *et al*., 1972) and resolves some ambiguous increase in serum Alanine Aminotransfase in cases of suspected myocardial infarction (Aach *et al*., 1981). When both enzymes (i.e. Alanine Aminotransferase and Aspartate Aminotransferase) are elevated in serum, the liver is the primary source of the enzymes (liver ischemia because of congestive heart failure or other sources of liver cell injury) (DeRitis *et al*., 1972). If the serum Aspartate Aminotransferase is elevated, while the serum Alanine Aminotransferase remains within normal limit, in case of suspected myocardial infarction, the results are compatible with myocardial infarction (Alex and LaVerne, 1983).

Conclusion

Weight gain of rams fed 10% level of inclusion of *F. sycomorus* was higher than the other treatment groups which signify efficient energy and protein utilization at tissue level. Dry matter intake (Kg $BW^{0.75}$) was similar among T_1 to T_3 dietary treatments, but rams had a higher apparent digestibility of most feed fractions compared to T_1 and utilized available N more efficiently than T_1. Both the haematological and serum metabolites are within range, except the PCV that is low. Results therefore, show that *F. sycomorus* can be used to substitute groundnut cake; though decrease in fibre digestibility should be taken into consideration, and the best level of substitution was 10% for *F. sycomorus***.**

References

Aach, R.O., Szmuness, W. and Mosley, J.W. (1981). Serum alanine Aminotransferase of donors in relation to the risk of non-A, non-B hepatitis in recipients. The Transfusion-Transmitted Virus Study. *N Engl J Med*, 304:989-94.

Abdu, S.B., Hassan, M.R., Jokthan, G.E., Adamu, H.Y., Yashim, S.M. and Yusuf, K. (2012). Effect of Varied Inclusion Levels of Gmelia (*Gmelina arborea*) Leaf Meal on Intake, Digestibility and Nitrogen in Red Sokoto bucks fed on Sorghum Glum Based Complete Diets. *Journal of Science Education Development Institute,* 2 (2): 79 – 84.

Adebowale, E.A., Orskov, E.R. and Shand, W.J. (1991). Use of ash cocoa pod husk as source of alkali for up grading crop residues with/without hydrogen peroxide. *Journal of Tropical Agricultural,* 68:27-32.

Achi, N. P., Achi, J. N. and Alphonsus, C. (2018). Effects of inclusion level and feeding regime of *ficus sycomorus* leaves on performance of yankasa rams fed *Digitaria smutsii* as basal diet. *J. Anim. Prod. Res*. 30(1):99-106.

Afaf, M. W., Afaf, A.M.B. and M.A. (2015). Evaluation of antioxidant and antimicrobial potential of different leaves crude extracts of Omani *Ficus carica* against food borne pathogenic bacteria.

Asian Pacific Journal of Tropical Disease, 5(1): 13-16

Ahn, J.H., Robertson, B.M., Elliott, R., Gutteridge, R.C. and Ford, C.W. (1989). Quality assessment of tropical browse legumes: tannin content and protein degradation. *Journal of Animal Feed Science and Technology* 27: 147-156.

Alex, K. and LaVerne, L. S. (1983). Clinical chemistry: Interpretation and techniques, 2nd edition. Seattle, Washington. Pp.156-339.

Anugwa, F.O.I. and Okori, A.U. (1987). The nutritive value of three Nigerian browse plants eaten by sheep. *Bulletin of Animal Health and Production in Africa,* 35: 23-228.

AOAC (2002). Official Methods of Analysis. 16th ed. Association of Official Analytical Chemists, Washington, DC.

Altman, R. B. (1979). Avian clinical Pathology, Radiology, Parasitic and Infectious Diseases. In: Proceedings of American Animals Hospitals Association, South Bend. IN.

Awodi, S., Ayo, J. O., Atodo, A. D. and Dzende, T. (2005). Some Haematological Parameters and the Erythrocyte Osmotic Fragility in the laughing Dove (*Streptopella senegalensis*) and the village weaver bird (*Ploceus scucullatus*). In: Chineke, C. A;

Bakshi, M. P. S. and Wadhwa, M. (2004). Evaluation of forest leaves of semi-hilly arid region as livestock feed. Asian-Australasian. *J. Ani. Sci.*. 95: 93-104.

Bekele, T., Birnie, A. and Tengnas, B. (1993). Useful trees and shrubs for Ethiopia. Regional Soil Conservation Unit (RSCU), Swedish International Development Authority (SIDA). http://www.worldagroforestry.org/sites/treedbs/treedatabases.asp

Belete Y., Urge M., Ameha N. and Beyene G. (2016). Effects of processed sholla (*Ficus sycomorus*) fruits inclusion in the diet on performance, egg quality characteristics and feeding economics of layers. *Livestock Research for Rural Development,* 28 (55). http://www.lrrd.org/lrrd28/4/bele28055.htm

Bengamin M.M. (1978). Online of veterinary clinical pathology 2nd edition, Iowa state University Press, Iowa U.S.A pp 35-105. [16] Jain, N.C. (1986). Haemotological Techniques in: Schalmis veterinary Haematology. Lea and Febiger Philadelphia.Pp.20-86.

Bianca, W. (1955). The Effect of Repeated Short Exposures to heat on the volume and hydration of the blood of the calf. *British Veterinary Journal,* 43: 171-180.

Baneejee, G. C. (2007). A Textbook of Animal Husbandry. 8th Edn. Published by Raju Primlani for Oxford and IBJ publishing Co. PVT Ltd, New Delhi. Pp. 1079.

Campbell, J. R., Kenealy, M. D. and Campbell K. E. (2003). Animal Science. The Biology, care and Production of Domestic Animals. McGraw Hill USA. Pp. 510.

Cheesbrough, M. (2004). District Laboratory Practice in tropical Countries. Part 2 University Press Cambridge United Kingdom, Pp.266-342.

Coles, E. H. (1986) Veterinary Clinical Pathology 4th edition NB Sandes Company. Harcourt Brace Jovarinch Inc.

Coles, E. H. (1980). Veterinary Clinician Pathology 3rd Edn. W.B. Sanders Co Philadelphia, Pp. 10-20.

DeRitis, F., Coltori, M. and Gisuti, G. (1972). Serum transaminase activities in liver disease. Lancet 1:685-87.

Duke, H.H. (1955). Physiology of Domestic Animals Livestock Publishing Associate A Division of Nornell University Press. Ithaca and London. Pp. 23-61.

Egbe-Nwiyi, T. N., Nwaosu, S. C. and Salami, H. A. (2000). Haematological Values of Apparently Healthy sheep and goats as influenced by age and sex in Arid Zone of Nigeria. *Afr J. Biomed. Res*. 3: 109-115.

Garg, S. K., Makkar, H.P.S., Nagal, K., Sharma, B.S.K., Wadhwa, D. R. and Singh, B. (1992). Oak (*Quercus incana*) leaf poisoning in cattle. *Vet. Human Toxicol*., 34: 161-164.

Gray, C. H. and Howarth, P.J.N. (1980). Clinical Chemical Pathology. 9th Edn. English Language Book Society and Edward Arnold (Publishers) Ltd. London.

Harper, H. A., Rodwell, V. W. and Mayer, P. A. (1977) review of Physiological Chemistry 6th Edn. California Lange Medical Publishers. Pp. 559-598. http//en.wikipedia.org/wiki/cholesterol

Henry, R. J., Chiamori, N., Golub, O. J. and Berkman S. (1960). Revise spectrophotometric method for Determination of Glutamic Oxalatic Transaminase and Glutamic Pyruvale Transaminase and lactic and dehydrogenase. *Am. J. Clinical Path,* 34.381.

Higa, M., Yogi, S., Hakama, K. (1987). Studies on the constituents of *Ficus microcarpa* L. f. I: Triterpenoids from the leaves. *Bull. Coll. Sci., Univ. Ryukyus,* 44: 75–86.

Horton, G.M.J. and Burgher, C.C. (1992). Physiological and carcass characteristics of hair sheep and wool breeds of sheep. *Small Rumin. Res*., 7: 51–60.

Ishaya, S. and Abaje, I. B. (2008). Indigenous people's perception on climate change and adaptation strategies in Jema'a local government area of Kaduna State, *Nigeria. J. Geo. Regional Plann*., 1(8): 138-143.

Jain, N.C. (1986). Haemotological Techniques. in: Schalms Veterinary Haematology. Lea and Febiger Philadelphia. Pp: 20-86.

Kassa, A. and Mekasha, Y. (2014) Effects Of Supplementation with Sycamore Fig (Ficus Sycomorus) on Performances of Washera Sheep Fed Natural Pasture Hay and Its Economic Benefit Global. *Journal of Animal Scientific Research*. 2(2): 130-142.

Kamalu, T. N., Sheffy, S. N. and Nair, S. G. (1988). Biochemistry of Blood of West African dwarf Goats. *Trop. Vet*. 6: 2-5.

Kohn, R.A., Dinneen, M.M. and Russek-Cohen, E. (2005). Using blood urea nitrogen to predict nitrogen excretion and efficiency of nitrogen utilization in cattle, sheep, goats, horses, pigs, and rats. *J. Anim. Sci*. 83: 879–889.

Kosgey, I.S., Rowlands, G.J., van Arendonk, J.A.M. and Baker, R.L. (2008). Small ruminant production in smallholder and pastoral/extensive farming systems in Kenya. *Small Ruminant Research,* 77: 11-24.

Latimer, K. S., Mahaffey, E.A. and Prasse, K.W. (2004). Clinical pathology: veterinary laboratory medicine 4th Ed., Iowa State University Press Ames, Iowa USA.

Lawan, S. A., Abbator, F. I. and Njidda, A. A. (2008). Performance of sheep fed sorghum husk supplemented with cowpea husk and cotton seed cake. *Nigerian Journal of Experimental and Applied Biology,* 9 (2): 145-149.

Lebbie, S.H.B. (2004). Goats under Household Conditions. *Small Ruminant Research*, 51: 131-136.

Leng, R. (1997). Tree foliage in ruminant nutrition. FAO Animal production and health paper, Rome, Italy.

McDonald, R.E., Edward, R.A., Greenhalgh, J.F.D. and Morgan, G.A. (2002). Animal nutrition 6th edition. Longman scientific and technical Co-published in the USA, John Wiley and Sons incorporated New York.

McSweeny, C.S., Palmer, B., McNeill, D.M. and Krause, D. O. (2001). Microbial interactions with tannins: nutritional consequences for ruminants. *Animal Feed Science and Technology*, 91:83–93.

Meissner, H.H., Viij, M.D., Van Neierkeki, W.A. (1991). Intake and Digestibility by Sheep of Anthephora, Panicum Rhode and Smuts Finger Grass Pastures: Proceedings of the 4th International Rangeland Congress, September, Montipellier, France. 1991, Pp. 648 – 649.

Milson, G. C., West, L. C. and Dew, S. M. (1960). Biochemical and Haematological Observations on the Blood and cerebralspinal fluid of clinically healthy and scrapie affected goats. *J. Camp Path.* 70:194.

Njidda, A.A. (2008). The effect of protein and energy supplementation on the growth performance of grazing sheep during the wet season. *Nig. J. Exp. Applied Biol*., 9: 17-22.

Njidda, A.A. (2010a). *In vitro* gas production and stoichiometric relationship between short chain fatty acids and *in vitro* gas production of semi-arid browses of North-Eastern Nigeria. *Global Veterinarian.* 4(3): 292- 298.

Njidda, A.A. (2010b). Chemical Composition, Fibre Fraction and Anti-Nutritional Substances of Semi-arid Browse Forages of North-Eastern Nigeria. *Nigerian Journal of Basic and Applied Science*, 18(2): 181-188.

Njidda, A. A. and Ikhimiaya, I. (2010). Correlation between chemical composition and *In Vitro* Dry matter digestibility of leaf of semi-arid browse of north–eastern Nigeria. *American-Eurasaian Journal of Agriculture and Environmental Science,* 9:169-175.

Njidda, A. A. (2011). Evaluation of the potential nutritive value of browse forages of semi-arid region of Nigeria. Ph D. Thesis, Ambrose Alli University, Nigeria. 219pp.

Njidda, A. A. Shuai'bu, A. A. and Isidahomen, C. E. (2014). Haematological and biochemical indices of apparently healthy sheep raised in semi-arid environment of northern Nigeria. *Global Journal of Science*, 14(2) : 49-56.

Njidda, A. A., Ikhimioya, I. and Muhammad, B. F. (2012a). *In sacco* and *in vitro* degradation of selected indigenous semi-arid Nigerian browses. *Biological and Environmental Sciences Journal for the Tropics*, 9(1): 56-61

Njidda, A. A., Ikhimioya, I. and Muhammad, B. F. (2012b). *In situ c*ellulose and hemicellulose disappearance and fermentation characteristics of some semi-arid fodder plants use as feeds for ruminants. *Biological and Environmental Sciences Journal for the Tropics,* 9(1): 79-85

Njidda, A. A., Olatunji, E. A. and Okoruwa, M. I. (2012). *In situ* degradability of dry matter of browse forages consumed by ruminants in the semi-arid region of northern Nigeria. *Journal of Biology, Agriculture and Healthcare,* 2 (9): 39-43.

Njidda, A. A., Olatunji, E. A.and Garba, M. G. (2013). *In sacco* and *in vitro* organic matter degradability (OMD) of selected semi-arid browse forages. *Journal of Agriculture and Veterinary Science,* 3(2): 9-16

Njidda, A. A., Olatunji, E. A.and Alkali, H. A. (2013). *In sacco* degradation of acid detergent lignin of semi-arid browse forages of northern Nigeria. *Biological and Environmental Sciences Journal for the Tropics*, 10(2): 159-166.

Njidda, A.A., Ikhimioya, I. and Isidahomen, C. E. (2013). *In situ* crude protein degradation and mineral composition of browse forages of semi-arid Nigeria. *Inter J. Agri Biosci*., 2(5): 286-296.

Njidda, A.A., Olafadehan, A. O. and Alkali, H. A. (2016). Dry matter degradability of five *ficus* species using *in situ* and *in vitro* techniques. *J. Anim. Prod. Res.,* 28(2):11-27.

Njidda, A.A., Olafadehan, O.A., Japhet, N., Omole, O.A. and Ofem, B.B. (2018). The effect of substituting cowpea husk with *daniellia oliveri* foliage on the performance of red sokoto goat. *Nigerian Agric. J.* 49(1): 1-10.

Norton, B.W. (1994). Tree legumes as dietary supplements for ruminants' pp. 192-201. In: Gutteridge R. C. and H. M. Shelton. Forage tree legumes in tropical Agriculture (CAB International).

Nkafamiya, I.I., Osemeahon, S.A., Modibbo, U.U. and Aminu, A. (2010). Nutritional status of non-conventional leafy vegetables, *Ficus asperifolia* and *Ficus sycomorus*. *African Journal of Food Science*, 4:104-108.

Oduye, O. O. and Fasenimi, F. (1971). Serum electrolyte and protein levels in the Nigerian White Fulani and Ndama Breeds of cattle. Bulletin epizootic diseases in Africa, 19:333- 339.

Oduye O.O and Adedevon B.K. (1976). Bio chemical values of apparently Normal Nigerian sheep. *Nigerian Veterinary Journal*, 5 (1):43-50.

Ogunsanmi, O.A., Ozegbe, P.C., Ogunjobi, D., Taiwo, V.O. and Adu, J.O. (2002). Haematology plasma Biochemistry and whole blood minerals of the captive Adult African Grasscutter (*Thryonomys swinderiamus*, Temnick), *Trop. Vet*., 20(1): 27-35.

Olorunnisomo, O. A., Ewuola, E. O. and Lawal, T. T. (2012). Intake and Blood metabolites in Red Sokoto Goats fed Elephant Grass and cassava Peel Silage. *Journal of Animal Production Advances*, 2(9): 420-428. ISSN: 2251-7677.

Orwa, C., Mutua, A., Kindt, R., Jamnadass, R. and Anthony, S. (2009). Agrofores tree database: a tree reference and selection guide version 4.0. http://www.worldagroforestry. org/sites/treedbs treedatabases.asp

Oser, B.L. (1979). Hawks Physiological Chemistry. Mc Grew Hill publishing company. New Delhi, India.

Peters, T., Biamonte G. T. and Doumas, B.T. (1982). Protein (Total protein) in serum. In : selected method of clinical chemist. Faulkner\, G.W.R and S. Mates (eds).Am. Assoc. Clin. Chem. Pp. 100-115.

Reed, J.D., Soller, H. and Woodward, A. (1990). Fodder tree and Stover diets for sheep: Intake, growth, digestibility and the effect of phenolics on nitrogen utilization. Database: a tree reference and selection guide version 4.0. *Journal of Animal Feed Science and Technology*, 30: 39-50.

Rusoff, L. L., Johnston, J. E. and Branton, C. (1954). Blood Studies of Breeding Dairy Bulls. *Journal of Dairy Sciences*, 47:30-36.

Salvador, J.A.R., Moreira, V.M., Gonçalves, B.M.F., Lealab, A.S. and Jing, Y. (2012). Ursanetype pentacyclic triterpenoids as useful platforms to discover anticancer drugs. *Nat. Prod. Reprod*., 29 (12): 1463–1479.

SAS (2002). SAS/STAT Guide to personal computers, version 9. Statistical Analysis System Institute. Inc., NC. North Carolina, USA.

Sheikha, K.M., Ruqaiya, N.S.W. and Hossain, M.A. (2015a). *In vitro* evaluation of the total phenolic and flavonoid contents and the antimicrobial and cytotoxicity activities of crude fruit extracts with different polarities from Ficus sycomorus. *Pac. Sci. Rev. A: Nat. Sci. Eng*., 17:103–108.

Sheikha, K.M., Ruqaiya, N.S.W. and Hossain, M.A. (2015b). Total flavonoids content and antimicrobial activity of crude extract from leaves of Ficus sycomorus native to Sultanate of Oman. Karbala Inter. *J. Mod. Sci.,* 1: 166–171.

Silva, A.M.A., Silva Sobrinho, A.G., Trindade, I.A.C.M., Resende, K.T. and Bakke, O.A. (2004). Food intake and digestive efficiency in temperate wool and tropic semi-arid hair lambs fed different concentrate: forage ratio diets. *Small Ruminant Research*, 55: 107–115.

Tambuwal, F. M., Agale, B. M. and Bangana, A. (2002). Haematological and Biochemical values of Apparently Healthy Red Sokoto Goats. In: Proceeding of 27th Annual Conference Nigerian Society of Animal Production (NSAP), March, 17-21, 2012, FUTA Akure, Nigeria.

Tegbe, T.S.B., Adeyinka, I.A., Baye, K.D. and Alawa, J.P. (2005). Evaluation of Feeding Graded Levels of Dried and Milled *Ficusthonningii*Leaves on Growth Performance, Carcass Characteristics and Organs of Weaner Rabbits. *Pakistan Journal of Nutrition,* 5(6): 548-550.

Van Soest, P.J., Robertson, J.B. and Lewi, B.A. (1991). Methods for dietary fibre, neutral detergent fibre and non-starch polysaccharides in relation to animal nutrition. *J Dairy Sci.*, 74(10):3583-3597.

Wampana, D.D., Abbator, F. I. and Njidda, A. A. (2008). Effect of supplementation on the performance of goats fed native pasture in semi-arid zone of Nigeria. *Nigerian Journal of Experimental and Applied Biology,* 9 (2): 119-123.

Wildeus, S., Turner, K. E. and Collins, J. R. (2007). Growth, intake, diet digestibility, and nitrogen use in three hair sheep breeds fed alfalfa hay. *Small Ruminant Research*, 69: 221–227.

Wilkins, J. H. and Hodges, R.E.D.H. (1962). Observations on Normal Goats Blood. *Royal Army Vet. Corp. J.* 33:7.

Yan, X.J., Gong, L.H., Zheng, F.Y., Cheng, K.J., Chen, Z.S. and Shi, Z. (2014). Triterpenoids as reversal agents for anticancer drug resistance treatment. Drug Disco. Today 19 (4): 482–488.

Table 1: Composition of the experimental diet (%)

Ingredient	T_1	T_2	T_3	T_4
Ficus sycomorus	0	5	10	15
Groundnut cake	20	15	10	5
Rice bran	19	19	19	19
Sorghum Stover	10	10	10	10
Sorghum offal	10	10	10	10
Maize offal	20	20	20	20
Wheat offal	20	20	20	20
Bone meal	0.5	0.5	0,5	0.5
Salt	0.5	0.5	0.5	0.5
Total	**100**	**100**	**100**	**100**
Calculate ME/MJ	**10.61**	**10.06**	**9.51**	**9.00**
Calculate CP	**16.92**	**16.55**	**15.33**	**15.01**

ME = Metabolizable energy, CP = Crude protein

Table 2: Chemical composition of the experimental died (g kg^{-1} DM)

Parameters	T_1	T_2	T_3	T_4	SEM	FSL
Dry mater	915.10^{a}	902.30^{b}	897.30^{b}	899.30^{b}	0.24	901.12
Crude fibre	286.90^{a}	221.90^{c}	266.30^{ab}	241.30^{bc}	1.65	172.60
Crude protein	78.40^{c}	102.40^{a}	84.90^{c}	95.10^{b}	0.65	180.20
Cellulose	266.10^{a}	209.30^{b}	257.20^{ab}	225.00^{ab}	0.30	197.10
Hemicelluloses	95.00	96.80	89.20	99.90	1.87	64.90
Ether extract	12.40^{c}	42.40^{a}	28.40^{b}	31.10^{b}	0.37	29.60
Acid Detergent Fibre	361.10^{a}	306.10^{d}	346.40^{b}	324.90^{c}	0.41	283.30
Acid Detergent Lignin	102.90^{c}	113.40^{ab}	106.40_{ab}	115.90^{a}	0.39	86.2
Neutral Detergent Fibre	456.10^{a}	402.90^{d}	435.60^{b}	424.80^{c}	2.39	348.20
Ash	21.10^{d}	116.30^{a}	70.20^{c}	82.90^{b}	0.28	8.35

a, b, c, d = means with different super script within the same row are significantly different (P<0.05)

Table 3: Performance and nutrient intake of Yankasa sheep fed *ficus sycomorus*

Parameters	T_1	T_2	T_3	T_4	SEM
Initial body weight (kg)	14.25	14.25	14.25	14.25	NAS
Final body weight(kg)	20.87^{b}	17.40^{d}	22.97^{a}	19.72^{c}	0.76
Weight gain(kg)	6.60^{b}	3.15^{d}	8.62^{a}	5.47^{c}	1.02
Average Daily Gain (kg day^{-1})	0.07^{b}	0.03^{d}	0.10^{a}	0.06^{b}	0.002
Dry matter intake (kg day^{-1})	2.56^{b}	2.26^{c}	3.25^{a}	2.35^{c}	0.57
Dry matter intake (kg $W^{0.75}$)	2.02	2.05	2.42	1.89	0.86
Feed conversion ratio	0.42^{b}	0.79^{a}	0.42^{b}	0.47^{b}	0.04

a, b, c, d = means with different super script within the same row are significantly different (P<0.05)

Table 4: Effect of *Ficus sycomorus* supplementation on nutrient digestibility of Yankasa sheep (g kg^{-1} DM)

Parameters	T_1	T_2	T_3	T_4	SEM
Dry matter	28.90^{a}	10.40^{bc}	06.40^{c}	14.50^{b}	0.22
Crude fibre	02.10^{d}	86.50^{b}	146.80^{a}	48.10^{c}	0.95
Crude protein	89.23^{c}	235.40^{a}	765.60^{a}	237.60^{b}	0.40
Ether extract	161.30^{b}	625.00^{a}	764.00^{a}	588.40^{a}	8.52
Cellulose	91.70^{b}	164.40^{a}	70.70^{b}	149.40^{a}	0.93
Hemicellulose	95.80^{b}	83.60^{b}	48.20^{c}	136.20^{a}	1.30
Acid Detergent Fibre	15.30^{c}	87.50^{a}	64.90^{b}	61.50^{b}	042
Acid Detergent Lignin	06.80^{b}	08.80^{b}	23.50^{b}	169.20^{a}	1.23
Neutral Detergent Fibre	13.50^{c}	45.20^{b}	61.50^{a}	15.10^{c}	0.33

a, b, c, d = means with different super script within the same row are significantly (P<0.05)

Table 5: Nitrogen balance of Yankasa breed of sheep fed *Ficus sycomorus* g day^{-1}

Parameters	T_1	T_2	T_3	T_4	SEM
Nitrogen intake	12.54^d	16.38^a	13.58^c	15.22^b	1,02
Nitrogen in faeces	0.93^a	0.50^b	0.78^{ab}	0.59^b	0.12
Nitrogen in urine	0.74^{ab}	1.25^a	0.58^c	1.03^{ab}	0.13
Nitrogen absorbed	11.61^c	15.88^a	12.75^{bc}	14.63^{ab}	0.94
Nitrogen retained	10.87^c	14.63^a	12.22^{bc}	13.60^{ab}	0.89
Nitrogen balance ($BW^{0.75}$)	5.98^{ab}	7.48^a	6.53^a	7.08^a	1.23
Total Nitrogen	1.67	1.75	1.36	1.62	0.92
Percent as N intake					
Faeces N	7.41^a	3.05^b	4.27^b	3.87^b	2.02
Urine N	5.90^c	7.63^a	5.74^c	6.76^b	0.37
Absorbed	92.50^b	96.74^a	93.88^{ab}	96.13^a	1.27
Retained	86.66	89.31	90.31	89.35	4.08

a, b, c, d = means with different super script within the same row are significantly differently (P<0.05)

Table 6: Effects of *Ficus sycomorus* on the haematological parameters of yankasa sheep

Parameters	T_1	T_2	T_3	T_4	SEM
Hb (g/.dl)	8.10±1.52	9.50±1.52	9.10±1.52	10.80±1.52	1.52
MCH (pg)	27.55^a ±0.39	13.05^a ±0.39	11.60^a ±0.39	13.50^b ±0.39	0.39
MCHC(g/dl)	26.55^a ±0.53	18.05^c ±0.53	23.35^b ±0.53	15.55^b ±0.53	0.53
MCV(fi)	17.30±2.34	15.30±2.34	18.10±2.24	18.00±2.34	2.34
PCV (%)	12.80±2.08	14.55±2.08	11.15±2.08	15.50±2.08	2.08
RBC (×10^2/1)	3.88±087	3.88±0.87	2.62±0.87	3.458±0.87	0.87
Lymphocyte (%)	28.80^b ±1.16	19.15^c ±1.16	16.35^d ±1.16	48.55^a ±1.16	1.16
Neutrophils (%)	11.20^b ±0.23	9.20^b ±0.23	10.10^c ±0.23	16.50^a ±0.23	0.23
Monocytes (%)	14.78^b ±1.02	13.60^b ±1.02	17.60^a ±1.02	13.60^b ±1.02	1.02

****a, b, c, d = means with difference super script within the same row are significantly different (P<0.05). Hb = hemoglobin, PCV = packed cell volume, RBC = Red blood cell, WBC = white blood cell.***

Table 7: Blood chemistry of yankasa bread of sheep fed *Ficus syncomorous*

Parameters	T_1	T_2	T_3	T_4	SEM
Urea (mmol/L)	4.81^b±0.66	6.50a±0.66	5.60ab±0.66	5.60ab±0.66	0.66
Sodium (mmol/L)	129.00±15.85	127.00±15.85	122.00±15.85	124.50±15.85	15.86
Potassium (mmol/L)	4.83±0.97	4.00±0.97	4.83±0.97	4.83±0.97	0.97
Chlorine (mmol/L)	98.50±4.74	101.00±4.74	105.00±4.74	103.00±4.74	4.74
Glucose (mmol/L	5.70±1.14	4.81±1.14	4.50±1.14	3.53±1.14	12.35
Creatinine (mmo/L)	88.50±12.35	97.00±12.35	86.50±12.35	96.00±12.35	12.35
Total Protein (g/L)	66.00^{ab} ±4.92	69.00^{ab} ±4.92	63.50^b ±4.92	75.50^b±4.92	4.92
HCO^{-3} (mmol/L)	29.00±6.59	28.50±6.29	28.50±6.29	29.50±6.59	6.59
Globulin (g/L)	44.00^a ±3.19	33.00^b ±3.19	33.50^b ±3.19	47.00^a ±3.19	3.19
Albumin (g/L)	53.00±9.24	42.00±9.24	37.00±9.24	49.00±9.24	9.24
AST (IU/L)	12.50±2.23	14.00±2.23	13.00±2.23	11.00±2.23	2.23
ALP (IU/L)	29.00^{ab} ±4.85	25.00^a ±4.85	25.00^b ±4.85	39.00^a ±4.85	4.85
ALT (IU/L)	32.0± 1.72	17.00± 0.47	39.0± 0.62	38.0± 0.78	2.35

a, b, c, d = means with different super scrip within the same row are significantly different (p>0.05). AST= Aspartate Aminotransferase; ALT= Alanine Aminotransferase; ALP= Alkaline Phosphate