

Odedire J. A., Olusegun-Bakare G.A., \*Akinropo T.F., Adelabu A.A., and Oluwatosin E.S  
 Department of Animal Sciences, Obafemi Awolowo University, Ile – Ife, Nigeria

\* Corresponding author: [akinropotobifestus@gmail.com](mailto:akinropotobifestus@gmail.com)

## Abstract

The experiment was conducted to determine the feeding preference and acceptability of *Sacciolepis africana* leaves by West African Dwarf (WAD) sheep and goat. *Sacciolepis africana* leaves were harvested and processed into four treatments viz: Diet 1 (Freshly cut *Sacciolepis africana*), diet 2 (Ensiled *Sacciolepis africana*), diet 3 (Air-dried *Sacciolepis africana*) and diet 4 (Sun-dried *Sacciolepis africana*). Proximate composition of the diets was carried out, using standard laboratory procedure and the feeding preference of twelve each, of growing WAD sheep and goats were observed. Results obtained indicated that the proximate composition of the diets were influenced ( $P < 0.05$ ) by the processing methods. Coefficient of Preference (CoP) of the diets for WAD goats revealed that ensiled *Sacciolepis africana* was the most preferred with a CoP of 1.70 while the WAD sheep relished fresh and Sun-dried *Sacciolepis africana* with CoP values of 1.40 and 1.26 respectively. It is concluded that, processing *Sacciolepis africana* improved its nutritional composition and acceptability by WAD goat while the fresh *Sacciolepis africana* was most preferred by WAD sheep.

**Keywords:** Acceptability, coefficient of preference, proximate composition, *Sacciolepis africana*, WAD

## INTRODUCTION

Scarcity of forages and low digestibility are major challenges of dry season feeding for ruminants in the tropics. The use of unconventional feed resources such as aquatic plants/weeds is gaining prominence because of its availability during the dry season to ease the scarcity. These aquatic plants have constituted an economical problem as it negatively affects aquatic animals' socio-economic activities such as fisheries, slows or even prevents water traffic, impedes irrigation, reduces the quality and quantity of water supply, obstructs water ways, and slows hydropower generation (Brendonck, 2003). Removal and consequent utilization of these “aquatic weeds” as animal fodder, in order to open up the water-ways, becomes imperative for sustainable livestock production and improved economic activities around the creeks. Some of the aquatic weeds that have been documented as a feed resource for ruminants include *Eichhornia crassipes* (Mako *et al.*, 2015; Abegunde and Akinropo, 2018), *Ipomoea aquatica* (Ali and Anilava, 2018). *Sacciolepis africana* is an aquatic weed that belong to the family *Poaceae*. It is commonly called purple swamp or cupscale grass (Judziewicz, 1990). The grass was described as a vivacious, herbaceous perennial grass of flooded rice paddies with thick spongy culms or decumbent, rooting at lower nodes in a swamp and shallow water throughout tropical Africa (Burkill, 1985). The objective of this study, therefore, was to evaluate the feeding preference of West African Dwarf (WAD) sheep and goat offered differently processed *Sacciolepis africana* leaves.

## Material and Methods

### *Experimental Site and Diets*

The experiment was conducted at the Teaching and Research Farm, Obafemi Awolowo University, Ile- Ife, Nigeria. *Sacciolepis africana* leaves (from apex to the third node) were harvested from a damp site near the

Obafemi Awolowo University dam, the leaves were subjected to different processing methods namely, air-drying, sun- drying and ensiling following standard procedures.

### Feeding Behaviour and Acceptability trial

Twelve West African Dwarf Sheep and Goat respectively were used to evaluate feeding pattern and acceptability of differently processed *Sacciolepis africana*, in a cafeteria experiment. The sheep and goats were housed in slatted pens and they were acclimatized for a period of seven days after which the animals were offered the experimental diets for another seven days with six hours of observation period. Fresh water was offered to the animals *ad libitum* during the period of the free choice observation. Parameters measured include feed intake, number of bites per minute and number of visits to each diet. Coefficient of preference (CoP) was calculated as the ratio of individual diet intake to the average intake of all the diets. A diet was considered acceptable when the CoP value is greater than, or equal to, one ( $\geq 1$ ) while ranking is based on percentage of preference.

### Proximate Components

Samples of each diet were taken, and oven- dried at 65 °C until constant weight was obtained for the purpose of dry matter, ether extract, crude fibre, Crude protein, ash and Nitrogen Free Extract determination, using the procedure of AOAC (2000).

### Statistical Analysis

Data obtained were subjected to Analysis of Variance using the General Linear Model procedures of SAS (2001). Significant differences between means were compared using the Duncan New Multiple Range test of the same package.

### Results and Discussion

Proximate composition of the diets is shown in Table 1. Dry matter (DM) contents of the diets were significantly ( $P<0.05$ ) affected by the different processing methods. Diet 4 (Sun – dried *Sacciolepis africana*) recorded the highest DM value of 90.00% while Diet 1 (fresh *Sacciolepis africana* leaves) expectedly recorded the least (18.00% DM). The differences observed in the DM content of the diets can be attributed to the elimination of the water content by the processing methods. The crude protein (CP) content of 25.59% for Diet 2 was significantly ( $P<0.05$ ) higher than others but all the CP values obtained in the study exceeded the minimum level of 8% necessary for the maintenance of goats and sheep (NRC, 2007).

Table 1: Proximate composition of the experimental diets

| Parameters (%)        | Diet 1             | Diet 2             | Diet 3             | Diet 4             | SEM  | P value |
|-----------------------|--------------------|--------------------|--------------------|--------------------|------|---------|
| Dry matter            | 18.00 <sup>d</sup> | 77.00 <sup>c</sup> | 84.00 <sup>b</sup> | 90.00 <sup>a</sup> | 8.68 | <0.0001 |
| Crude protein         | 24.50 <sup>b</sup> | 25.59 <sup>a</sup> | 24.06 <sup>c</sup> | 23.72 <sup>d</sup> | 0.22 | <0.0001 |
| Crude fibre           | 19.75 <sup>c</sup> | 20.30 <sup>a</sup> | 20.23 <sup>b</sup> | 19.70 <sup>d</sup> | 0.09 | <0.0001 |
| Ether extract         | 9.90 <sup>b</sup>  | 10.00 <sup>a</sup> | 8.96 <sup>d</sup>  | 9.75 <sup>c</sup>  | 0.12 | <0.0001 |
| Ash                   | 12.26 <sup>a</sup> | 11.53 <sup>b</sup> | 9.13 <sup>d</sup>  | 10.17 <sup>c</sup> | 0.37 | <0.0001 |
| Nitrogen free extract | 33.59 <sup>c</sup> | 32.57 <sup>d</sup> | 37.61 <sup>a</sup> | 36.67 <sup>b</sup> | 0.63 | <0.0001 |

<sup>a-d</sup> = Means in a row with difference superscripts are significantly ( $P<0.05$ ) different. Diet 1: Fresh *Sacciolepis Africana*; Diet 2: Ensiled *Sacciolepis africana*; Diet 3: Air-dried *Sacciolepis africana*; Diet 4: Sun-dried *Sacciolepis africana*; SEM: Standard Error of Mean.

Table 2 shows the Coefficient of Preference (CoP) of the experimental diets by West African Dwarf goat. The forage preference on cafeteria basis revealed that ensiled *Sacciolepis africana* was the most preferred with a CoP of 1.70. CoP values for other treatments fell below Unity (1.0) and as such they are regarded as unacceptable (Olorunnisomo and Fayomi, 2012).

Table 2: Coefficient of preference of differently processed *Sacciolepis africana* offered to WAD goat

| Diets | Coefficient of preference | Rank            |
|-------|---------------------------|-----------------|
| 1     | 0.88                      | 2 <sup>nd</sup> |
| 2     | 1.70                      | 1 <sup>st</sup> |
| 3     | 0.34                      | 4 <sup>th</sup> |
| 4     | 0.71                      | 3 <sup>rd</sup> |

Diet 1: Fresh *Sacciolepis Africana*; Diet 2: Ensiled *Sacciolepis africana*; Diet 3: Air-dried *Sacciolepis africana*; Diet 4: Sun-dried *Sacciolepis africana*; SEM: Standard Error of Mean.

Figures 1& 2 showed the behavioural pattern of West African Dwarf goat in terms of Bite per minute and the number of visits to each diet, which revealed significant ( $P<0.05$ ) variations among the treatments. This connotes that WAD goat consume more of (fresh and ensiled *Sacciolepis africana* (Treatments 1 and 2 respectively) than other diets. It can be inferred from this observation that the smell/odour of the silage greatly influence its acceptability by WAD goat.

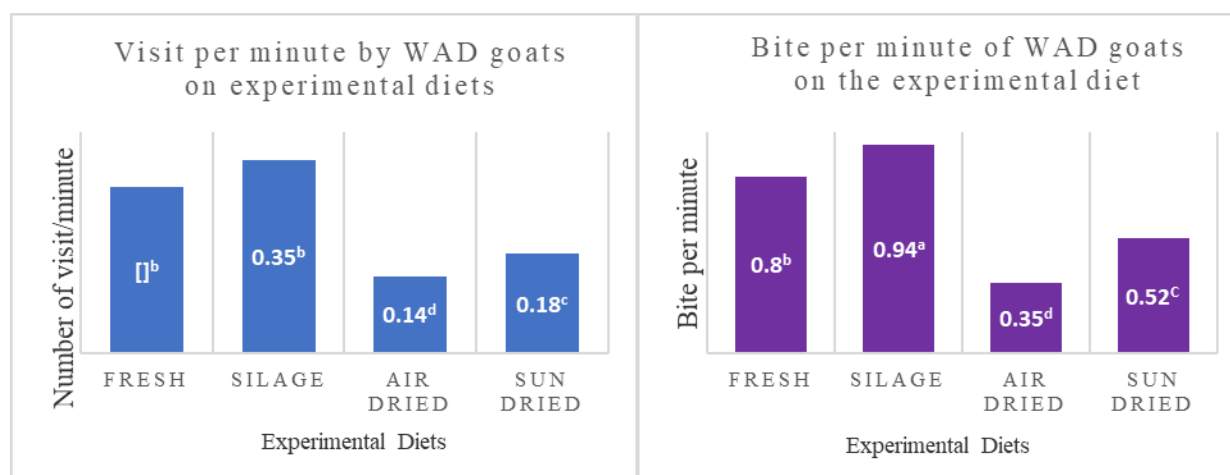


Figure 1: Visit per minute of WAD goat on the diets Figure 2: Bite per minute of WAD goat on the diets

Table 3 shows the Coefficient of Preference (CoP) of the diets by West African Dwarf (WAD) sheep. The cafeteria study showed that the fresh and the sun-dried *Sacciolepis africana* was the most relished with a CoP of 1.40 and 1.26 respectively, while the other two treatments were adjudged to be unacceptable with a CoP value of 0.63 and 0.35 for ensiled and air-dried *Sacciolepis africana* respectively (Olorunnisomo and Fayomi, 2012).

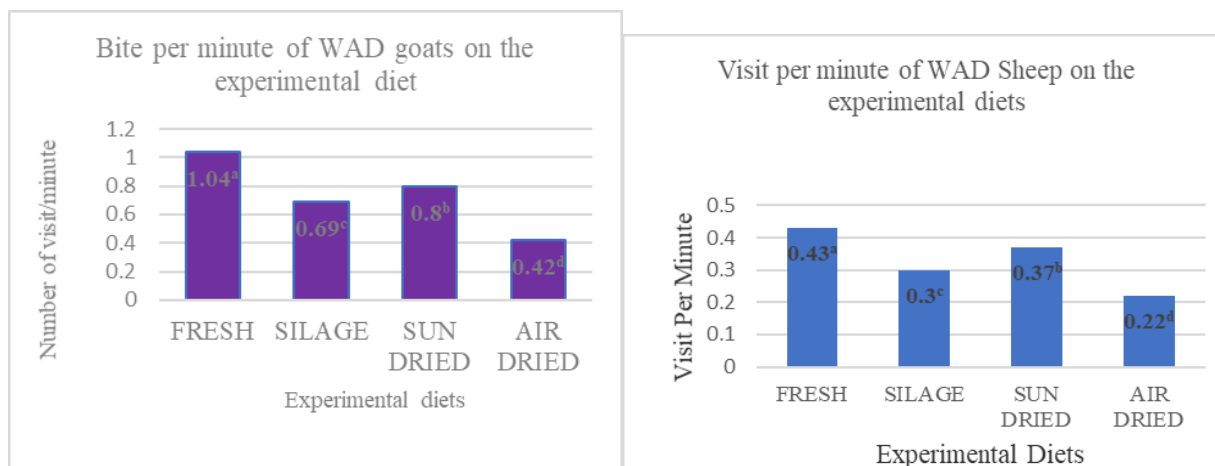
Table 3: Coefficient of preference of differently processed *Sacciolepis africana* offered to WAD Sheep

| Diets | CoP  | Rank            |
|-------|------|-----------------|
| 1     | 1.40 | 1 <sup>st</sup> |
| 2     | 0.63 | 3 <sup>rd</sup> |
| 3     | 0.35 | 4 <sup>th</sup> |
| 4     | 1.26 | 2 <sup>nd</sup> |

Diet 1: Fresh *Sacciolepis Africana*; Diet 2: Ensiled *Sacciolepis africana*; Diet 3: Air-dried *Sacciolepis africana*; Diet 4: Sun-dried *Sacciolepis africana*; SEM: Standard Error of Mean.

**NSAP****47<sup>th</sup> Annual Conference**  
(JOS 2022)**CONFERENCE PROCEEDINGS**THEME  
SECURING ANIMAL  
AGRICULTURE AMIDST  
GLOBAL CHALLENGES

Presented in Figures 3 & 4 are the behavioural pattern of West African Dwarf (WAD) sheep in terms of Bite per minute of the diets and the number of visits to each diet, which revealed significant ( $p < 0.05$ ) variations among the diets. This implies that WAD sheep consumed more of fresh and sun-dried *Sacciolepis africana* respectively than other diets. It can be inferred from this observation that the form of presentation of the fresh *Sacciolepis africana* influenced its acceptability by WAD sheep.



### Conclusion

Processing *Sacciolepis africana* improved its nutritional composition and acceptability by West African Dwarf goat while the fresh *Sacciolepis africana* was most relished by West African Dwarf sheep.

### References

- Abegunde, T.O., and Akinropo, T.F. (2018). Performance and Hematology parameters of West African Dwarf Goats fed Water Hyacinth ensiled with Breadfruit. *Bulletin of Animal Health and Production in Africa*. 66(4):727 – 740.
- Ali, S and Anilava, K (2018). Aquatic weed *Ipemoea aquatica* as feed ingredient for rearing Rohu, *Labeo rohita* (Hamilton). *Egyptian Journal of Aquatic Research* 44:321-325. <http://doi.org/10.1016/j.ejar.2018.09.004>
- AOAC (2000). Association of Official Analytical Chemist, Official methods, 13<sup>th</sup> edition, Washington, D.C.
- Brendock, L. (2003). The impact of water hyacinth (*Eichhornia crassipes*) in a eutrophic subtropical impoundment (Lake Chivero, Zimbabwe). II. Species diversity. *Archives Hydrobiological* 158: 389-40.
- Mako, A.A., Akinwande, V.O., Ettu, R.O., Awobajo, O.K., Abegunde, T.O., Abiola-olagunju, O., Olumide, M.D and Mosuro, A.O. (2015) Haematological and serum biochemical profile of weaner rabbits fed ensiled water hyacinth based diets. *Proceedings of 20th Annual conference. Animal science Association of Nigeria*. Ibadan Pp 390 – 393
- NRC. (2007). Nutrient Requirements of Goats. National Research Council, National. Academy Press Washington, D.C. United States of America.
- Olorunnisomo, O.A. and Fayomi, O.H. (2012). Quality and preference of zebu heifers for legume or elephant grass-silages with cassava peel. *Livestock Research for Rural Development* 24 (9) #168 <http://www.lrrd.org/lrrd24/9/olor24168.htm> {Retrieved: 30/10/2021}
- SAS (2001). Statistical Analysis System. SAS/STAT User's Guide Statistics. SAS Institute Inc. Cary, North Carolina, 2001 Edition.