

**NSAP****47th Annual
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PROCEEDINGS**THEME
**SECURING ANIMAL
AGRICULTURE AMIDST
GLOBAL CHALLENGES****GROWTH PERFORMANCE EVALUATION OF PREGNANT WEST AFRICAN DWARF (WAD) DOES FED MULBERRY (*Morus alba*) LEAVES AS SUBSTITUTE FOR *Panicum maximum*.****Adebayo, O.A and Ibhaze, G.A**

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***Corresponding author e-mail:** jomilojubabe@gmail.com. +2347037908717**ABSTRACT**

A 150-day study was conducted to evaluate the growth performance of intensively managed West African Dwarf (WAD) does fed *Panicum maximum* substituted with *Morus alba* leaves with an equal proportion of cassava-peel based concentrate. Twenty-five (25) West African Dwarf does with an average live weight of 10-13kg were used in a Completely Randomized Design with animals grouped into five treatments of five replicates each and housed in individual pens. Five diets T_1 , T_2 , T_3 , T_4 and T_5 were formulated to contain 0, 25, 50, 75 and 100% *Morus alba* substitution levels. Results revealed that there was no significant ($P > 0.05$) differences on all the growth performance parameters measured. The highest value of average daily weight gain (60.19 g/day) was observed in goats fed diet T_3 , while the lowest (37.27 g/day) value was obtained in goats fed diet T_1 . Goats placed on diet T_3 had the best feed conversion ratio value (14.38). This study, however, concluded that *Morus alba* substitution in feeding traditionally managed WAD goats enhanced growth performance without health challenges to the animals during gestation. *Morus alba* inclusion at 50% in West African dwarf goat's diet had effects on the overall performance of the animals with a potential improvement in feed conversion ratio.

Keywords: growth, *Morus alba*, *Panicum maximum*, reproduction, WAD goats,**INTRODUCTION**

Small ruminants (goats and sheep) occupy an important position in the farming system of southern Nigeria because of their unique ability and adaptation to the prevailing conditions of weather and available range of grasses with browse plants (Onyeonagu, and Asiegbu, 2008). Goats constitute a very important part of the rural economy in Nigeria, with more than 95% of the rural households keeping goats (Ukpabi *et al.*, 2000). One of the limiting factors for ruminant production is the inadequate and low quality of feed stuff during the dry season in the semi-arid zone of Nigeria (Abdurrahman, 2017). The effects of these challenges resulted in poor productivity of livestock and lower quantity of animal protein available for human consumption in the third world (Adebisi *et al.*, 2016). Mulberry leaves (*Morus alba*) has been reported to be rich in protein (15 – 35%), minerals (2.42 – 4.71% Ca, 0.23 – 0.97% P) and metabolizable energy (1,130 – 2,240 kcal/kg) (Venkatesh *et al.*, 2015). *Panicum maximum* is one of the most important tropical grasses and is highly palatable to ruminant animals (Lawal-Adebawale, 2012) but becomes dry and lignified during the dry season (Adewumi *et al.*, 2018). Hence, this study was designed to evaluate the growth performance of West African Dwarf (WAD) does during pregnancy.

MATERIALS AND METHODS

The experiment was carried out at the Goat Unit, Teaching and Research Farm of the Federal University of Technology (FUTA), Akure; located on Latitude $7^{\circ} 18''$ and Longitude $5^{\circ} 10''$ E (Aro *et al.*, 2008). Fresh mulberry (*Morus alba*) leaves were collected from Ondo State Ministry of Agriculture Sericulture Centre, Akure while fresh *Panicum maximum* was sourced from the pasture within the FUTA campus. The experimental concentrate was formulated from dried crushed cassava-peel with other feed ingredients. Five diets T_1 , T_2 , T_3 , T_4 and T_5 were made to contain 100% *Panicum maximum* (P100M0), 75% *Panicum maximum* + 25% *Morus alba* (P75M25), 50% *Panicum maximum* + 50% *Morus alba* (P50M50), 25% *Panicum maximum* + 75% *Morus alba* (P25M75) and 100% *Morus alba* (P0M100), respectively. Twenty-five (25) pregnant WAD does aged between 12-18 months with an average live weight of 10-13kg were used in this study. The goats were randomly distributed into five treatment groups of five goats per treatment using the completely randomized experimental design and each



experimental diets was offered *ad libitum* and the concentrate was given at a constant rate (300 g/day). Freshwater was offered *ad libitum*. The weights of the experimental animals were taken before the commencement of the experiment and it was done by using spring balance scale 20kg capacity and the final weight of the goats were taken at the end of the experimental period of 21 weeks. The weight gain was determined by subtracting the initial weight of does from their final weight and the daily voluntary feed intake of goats was calculated as the difference between daily feed given and left over throughout the experimental period. Data collected during the experimental period was subjected to one-way analysis of variance (ANOVA) using SPSS (2017) and the means were separated using Duncan Multiple Range Test of the same software at 5% level of significance.

RESULTS AND DISCUSSION

The growth performance of the pregnant West African Dwarf does fed experimental diets is presented in Table 1. The initial weight, final weight, weight gain, daily weight gain, forage intake, concentrate intake, total feed intake and feed conversion ratio were not significantly ($P>0.05$) different. However, there was significant ($P<0.05$) difference in the total dry matter intake. There was an improvement in the final weight over the initial weight of the animals. The highest value (8.67kg) for weight gain was observed in diet T₃ and the least value (5.37kg) was observed in the diet with 0% *Morus alba* leaf substitution. Likewise, the highest value (60.19g) for daily weight gain was recorded in the treatment with 50% *Morus alba* leaf inclusion and the lowest value (37.27g) was observed in the diet with 0% *Morus alba* leaf inclusion. Animals fed with the 50% *Morus alba* leaves inclusion diets were superior in their total feed intake and dry matter intake. The feed conversion ratio ranged from 14.38-27.58. However, the result showed that T₃ had the best feed utilization of 14.28. The non-significant high feed intakes reported in

this study may indicate high palatability of the diets. The superior FCR of diets T₃ over the other diets is a reflection of the observed higher growth rates and higher feed utilization of the goats fed with the diet.

Table 1: Growth performance of pregnant West African Dwarf does fed experimental diets

Parameters	DIETS					SEM	P-VALUE
	T ₁	T ₂	T ₃	T ₄	T ₅		
Final Weight (Kg)	19.03	19.67	19.47	18.93	21.80	1.47	0.76
Initial Weight (Kg)	13.67	12.13	10.80	11.20	13.20	1.57	0.68
Weight gain (Kg)	5.37	7.53	8.67	7.73	8.60	1.36	0.61
Daily Weight gain(Kg)	37.27	52.32	60.19	53.70	59.72	9.45	0.61
Concentrate intake (g/day)	279.83	276.70	279.49	272.03	272.60	2.44	0.28
Grass intake (g/day)	556.87	564.77	580.95	578.43	566.11	6.75	0.23
Total feed intake (g/day)	836.69	841.48	860.44	850.47	838.71	8.57	0.39
Total Dry matter intake(g/day)	440.80 ^{bc}	428.83 ^c	461.46 ^a	427.18 ^c	447.74 ^{ab}	4.16	0.00
Feed Conversion ratio	27.58	20.33	14.38	15.97	14.66	3.50	0.26

^{abc} Means on the same row having different superscripts are significantly different ($p<0.05$); T₁ = 100% *Panicum maximum* (P100M0); T₂ = 75%*Panicum maximum* + 25% *Morus alba* (P75M25); T₃ = 50% *Panicum maximum*+ 50% *Morus alba* (P50M50); T₄ = 25% *Panicum maximum*+ 75% *Morus alba* (P50M50); T₅ = 100% *Morus alba* (P0M100). SEM – Standard error of means

The growth performance in this current study showed that the weight gain of the animals were not significantly different. Final weight obtained in this study is higher than the values (8.80 – 11.00kg) recorded by Anaeto *et al.* (2013). Results obtained can be attributed to the genetic make-up of the individual goat and the rate of foetus development in the uterus which corroborate the findings of Oyeyemi *et al.* (2011) and Amosu *et al.* (2020) who observed significant change in final weight of two breeds of goats during gestation period. The result of this

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study on weight gain is in agreement with the report of Nkoku and Evbuomwan (2014) that efficient utilization of nutrients in diets that supply adequate energy and protein is required for optimum growth performance of ruminants. The significant weight change observed in the supplemented does could be attributed to the antioxidant activity of the *Morus alba* leaves (Monica *et al.*, 2011; Wen *et al.*, 2019) that reduced stress due to oxidation during the whole gestation period and caused there to be energy balanced between both the foetus and the dam. The higher weight change and the daily weight gain observed in the supplemented groups might also be an indication of the protective role of *Morus alba* leaves during the 'dam-foetus' materials exchange which corroborate the findings of Wen *et al.* (2019) who reported that *Morus alba* had several immune-related protective effects against apoptosis. Hence, *Morus alba* can be said to be related to immune response and making rumen degradable nitrogen available thereby resulting in growth, better performance and wellness.

CONCLUSION AND RECOMMENDATIONS

From the results of this study, it can be concluded that feeding *Morus alba* leaves up to 50% substitution level to West African Dwarf goat has no deleterious effect on pregnancy development. I recommend that goat farmers could feed the supplement containing up to 50% *Morus alba* leaves to their pregnant does in the dry season for better growth performance.

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