HERBAGE ACCEPTABILITY BY GRASS CUTTERS *(Thryonomys swinderianus* T.) IN DOMESTICATION PROCESS

Luke O. Falade[1]*, Kingsley O. Idahor* and Mohammed A. Mailafiya[3]
Department of Forestry, Wildlife and Fisheries, Nasarawa State University,
Shabu-Lafia Campus, P.M.B 135 Lafia, 950101, *Nigeria*
Department of Animal Science, Nasarawa State University,
Shabu-Lafia Campus, P.M.B 135 Lafia, 950101, *Nigeria*
'Department of Forestry, Wildlife and Range Management, College of Agriculture, Lafia, Nigeria
^Corresponding author: flo orb@yahoo.com Received: June 07,2011;
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Abstract

Gross *cutters could be reared in captivity to supplement the meat from livestock to boost animal protein intake by Nigerians. Since they are herbivores, they should not compete with man for grains and cereals to thrive in domestication hence, herbage acceptability trial was carried out. Browse trees herbages were harvested and offered as supplements to pineapple crown, cassava tubers and sugar cane as basal feeds. Time of fodder acceptance as well as level of intake was monitored. The results revealed that siam weed, bush tea and tridax were absolutely (0.0 g) rejected by the animals. They however nibbled at Christmas bush (5.67 g), black velvet (4.0 g), sheabutter (1.33 g) and wild custard apple (1.0 g). This discovery could encourage domestication of grass cutters to boost animal protein availability. More interestingly, the results would have provided hints and guides on browse plant utilization in grass cutters rearing, which they could not discover in the wild as subterranean animals that never climb.*

Keywords: Browse, domestication,fodder, grass cutter

INTRODUCTION

Grass cutters are rodents belonging to the Family-*Thryonomydae* with two distinct species-*Thryonomys swinderianus* and *T. gregorianus.* Both species are found throughout Africa with higher population density in Cameroon, Ethiopia, Kenya, Malawi and Central Africa Republic. Others are Mozambique, Nigeria, Tanzania, Zambia and Zimbabwe (Akinola, 2008). T. *swinderianus* could weigh up to 9 kg with body length of about 60 cm. The T. *gregorianus* is smaller in size weighing about 8 kg and 50 cm long with short tail. In both species, the males (bucks) are larger than the females (does). When fully matured, die average dressing-out percentage ranges between 64 68 % and as high as 80 % when the heads and entrails make up the total edible portion (Fayenuwo & Akande 2002; Ajayi &Tewel980jL i! •

According to Fayenuwo *el al.* (2003), the meat quality could compare favourably well with other domesticated livestock species. In Africa, grass cutters could produce up to 40,000 tons of meat per annum. Thus, capable of contributing immensely to the 20% of animal protein consumed in the continent (NRC, 1991). The meat is highly acceptable throughout the region and in Nigeria it is commonly called "bush meat". In Bird it is called "Evuato", "Oya" in Yoruba, "Nchi" in Ibo, and "Geogi" in Hausa as well as "Udi" in Urhobo (Fayenuwo & Akande 2002; Tewe *et al.,* 1998). Unfortunately, the high demand for this "bush meat" and the perception that grass cutters are crop pest has resulted in indiscriminate poaching. With this extinction threat, strategies to slow or reverse this dastardly phenomenon should be adopted. To this end, there is an urgent need for domestication and Jayeoba *et al.* (2010) suggested the development of National and International policies supporting reproductive technologies in managing and conserving wildlife species. Successful breeding and reproductive methods in grass cutters domestication has been reported (Addo, 2002) yet, there seems to be lack of information on grass cutters nutrition in domestication. Thus, the present study investigated acceptance of cut browses offered as green foliages by grass cutters in domestication .process. This becomes very important due to the fact that grass cutters are not climbers and as such may not have discovered more palatable browse species than grasses in the wild.

MATERIALS AND METHODS

Experimental Site and Climatic Conditions

The study was conducted in the Domestication Unit, Department of Forestry, Wildlife and Fisheries, Nasarawa State University, Keffi, Lafia Campus, Nigeria. Lafia lies on latitude 8" 35'N,

longitude 8° 32'E, altitude 181.53 m above sea level with mean temperature of 34°C, relative humidity of 40 86 % and average day light of 9 12 h (NIMET 2009).

Feeding Trial

Fresh herbages of ten plant species were harvested in the month of March within the Campus and were identified in the herbarium adopting Akobundu &Agyakwa (1998) procedure. Each plant species as shown in Table 1 was harvested every morning and offered fresh for a day.

A total of five animals (3bucks to 2does ratio) were used in the feeding trial. The bucks weighedbetween 4, 0 5.0 kg while the does weighed 3.0 3.5kg. Each animal was housed in an individual concrete pen and was fed 100 g of each plant species as supplementary feed daily for ten days. Meanwhile, each animal was also offered pineapple peel, cassava tuber and sugar cane as basal feeds with clean drinking water. Before serving the fresh plant species at 09:00 GMT each day, the basal feeds were all withdrawn at 08:00 GMT to create appetite in the experimental animals. After 1 h time period (i.e. at 10:00 GMT), the basal feeds were all returned and both the test *y* feeds (plant species) and the basal feeds were left in separate feeders in the pens till the following morning. After 22 h, the leftover of the test feeds only were weighed and all the pens were cleaned before fresh offer was made. The pens and the immediate surroundings were kept clean and well illuminated at night to enhance *ad libitum* feeding required for a successful domestication.

Data Collection

The herbage served were observed for any bite and the differences in weight of the test feeds offered and the leftover at 1 h (Immediately) and 22 h (Overnight) time periods respectively were recorded as intake (acceptance). To have an idea of possible moisture lost in the test feeds, 100 g of the test feed was placed in empty pens and the differences in weight at Ihr and 22 h time periods were recorded to determine moisture lost. In any case, the test feed samples were weighed using a sensitive digital weighing balance (MX RADY 300 WinteckNig.Ltd).

Data Analysis

The data collected were subjected to analysis of variance procedures of SAS (2001) and the mean values were compared according to Duncan's procedure of the same software package. Also, the data were subjected to Pearson correlation matrix where applicable to establish any interrelationship between plant species, test feed intake and sex of the grass cutters.

RESULTS AND DISCUSSION

The plant species intake by grass cutters in domestication process is given in Table 2. There were significant differences ($p<0.05$) in the intake levels among the plant species. Although Christmas bush intake took the lead (5.67 g) over black velvet and gamba grass with 4.0 g intake each, they did not differ statistically ($p>0.05$). It was observed that sheabutter; wild custard apple, black plum and African balsam were reluctantly accepted at less than 2.0 g yet, they were not statistically different ($p>0.05$) from each other. On the other hand, Siam weed, bush tea and tridax were absolutely (0.0 g) rejected. The intake levels of the plant species by the experimental animals were far less than 100 250 g feed consumption levels reported for full matured grass cutters (Fayenuwo <*a/.,2003).

The disparity observed could be largely due to the fresh nature of the herbages that were cut and offered the same day rather than the following day recommended by Fayenuwo *et d.* (2003). Above all, it could be as a result of their unfamiliarity with the plant species herbages and most likely due to the feed supplementary nature of the trial, in which their basal feeds left in the pens were probably preferred. Little wonder, they did not accept any plant species herbage at 1 h time period except Christmas bush, black velvet and gamba grass. The influence of sex on time of fodder acceptance by grass cutters in domestication is presented in Table 3. There were significant differences ($p<0.05$) in total fodder intake between the bucks and does at 1 h time period whereas, there were no statistical differences ($p>0.05$) during 22 h period. Total fodder intake by the bucks (5.03 g) at Ihr duration was statistically superior ($p<0.05$) to 3.9 g consumed by the does. This trend was however opposed to, during the 22 h period where does intake (50.35 g) was not statistically higher ($p>0.05$) than 49.4 g consumed by the bucks.

This discovery may be difficult to explain since the bucks were 'more in number and also heavier in weight. However, it could be largely due to the physiological demand of pregnancy at first trimester of one of the does, which Fayenuwo *et d.* (2003) speculated could influence quantity of feed consumed by grass cutters in a day. The interrelationships between the plant species, fodder intake and sex of grass cutters in domestication process are shown in Table 4. There were positive and negative correlations among the parameters measured. It was observed that animal population and animal sex versus animal weight

Table 1: Plant species offered to grass cutters in domestication process

S/NO	Common Name	Botanical Name	Local Name (Hausa)
1	**Sheabutter**	*Vitelaria paradoxum*	Kade
2	**Wild custard Apple**	*Anona senegalenses*	Gwandadaji
3	**Black plum**	*Vitex doniana*	Dinya
4	**Christmas bush**	*Alchornia cordifolia*	Bombomi
5	**African balsam**	*Daniella oliveri*	Kadaura
6	**Black velvet**	*Dialium guineenses*	Dinya
7	**Gamba grass**	*Andropogon gayamus*	Gamba
8	**Slam weed**	*Chromolaena odorata*	Awolowo
9	**Bush tea**	*Hyptis Suaveolens*	Maganisauro
10	**Tridax**	*Tridax procumbens*	Abichi zomo

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Forage species	Acceptance time		Intake(g)	P-value	Moisture lost (%)
	1h	22h			
C hristmas bush	Yes	Yes	5.67[a]	0.07	0.04
Black velvet	Yes	Yes	4.00[a]	0.07	0.04
Gamba grass	Yes	Yes	4.00[a]	0.07	0.06
Sheabutter	No	Yes	1.33[b]	0.21	0.08
Wild custard apple	No	Yes	1.00[b]	0.21	0.06
Black plum	No	Yes	0.83[b]	0.21	0.05
African balsam	No	Yes	0.17[b]	0.21	0.01
Slam weed	No	Yes	0.00[c]	1.00	12.00
Bush tea	No	No	0.00[c]	1.00	8.00
Tridax	No	No	0.00[c]	1.00	10.00

Table 3: Influence[1] of sex on time of fodder acceptance ^ gnu cutters in domestication process

Acceptance time	Sex	Intake	P-value
1 h (immediately)	**Buck**	**5,03'**	**0.06 .**
	Doe	**3.90[b]**	**1.00**
22 h (overnight)	**Black**	**49.40**	**0.29**
	Doe	50.35	
			0.29

Table 4: Pearson cornelation matrix between forage spieces, fodder intake and sex of grass cutters in domestication processs.

Factors	AP	PS	AS	AW(kg)	ML (%)	LO	HI	HI(%)
AP	I							
PS	0.000	I						
AS	0.917**	0.000	I					
AW(kg)	-0.567**	0.000	-0.873**	I				
ML(%)	0.007	0.249	0.177	-0.390**	I			
LO	-0.020	-0.620**	-0.052	0.043	-0.216	I		
HI	0.020	0.620	0.052	-0.043	0.216	-1.000**	I	
HI(%)	-0.010	-0.624**	-0.076	-0.118	-0.417**	-0.976**	-0.976**	I

** significance (p<0.01), AP:Animal population:PS:plant spieces: AS:Animal sex; AW: Animal weight; ML(%):percentage moisture lost, LO: leftoverherbage; HI: Herbage intake; HI(%): percentage herbage intake.

were negatively correlated and highly significant (p<0,01). In the same vein, animal weight versus percentage moisture lost as well as animal population, plant species, animal sex and percentage moisture lost versus leftover herbage were negatively correlated and statistically different (p<0.01). Similarly, animal weight and leftover herbage versus herbage intake were negatively correlated and statistically different (p<0.01). More interestingly, it was discovered that all the factors were negatively correlated to the percentage herbage intake and were statistically different (p<0.01) from one another. Meanwhile, it was observed that none of the positive correlated values were statistically significant (p>0.01) except animal population versus animal sex and plant species versus herbage intake. The negatively correlated and highly significant (p<0.01) values recorded could be largely due to the plant species that were offered fresh instead of sun drying during wet season as reported by Fayenuwo *et al.* (2003). Whereas, the positively correlated and highly significant (p<0.01) values could be attributable to phytophage habit of the experimental animals. This observation corroborated the report of Fayenuwo & Akande (2002) that grass cutters cherish elephant, guinea, gamba and congo grasses in the wjld.

CONCLUSION

Since some of the plant species were accepted by grass cutters in domestication process, it implies that they could be offered either as supplements or sole feeds. As a result, there may be drastic reduction in grass cutters competing with man for grains, cereals and legumes which has been the bane of livestock productivity in Nigeria. This may be an assurance of boosting animal protein intake as grass cutters would be reared at homestead or commercial level, to supplement the meat from other domesticated livestock species. Consequently, more tree plant species could be investigated to have a vast array of highly palatable browses than grasses that could be utilized by the grass cutters but were not discovered in the wild since they are f orssorian animals that cannot climb.

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