

TETHERING - FEEDING SYSTEM: THE EFFECT ON PERFORMANCE OF WEST AFRICAN DWARF GOATS

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ABSTRACT

A study was carried out for 77 days using 18 growing West African Dwarf goats to investigate the effect of tethering feeding on performance of goats on free range and tethering. Goats were allocated into three treatments and each was replicated twice in a completely randomized design. The treatments were free grazing (T0) control tethering at 9.5cm (T1) and tethering at 183cm (T2) T1 and T2 groups were fed measured concentrate and water while forage was offered ad-libitum. Data were collected on live weight, total weight gain, daily weight gain, concentrate and dry matter intake as well as feed conversion ratio (FCR) which were statistically analyzed and significant means separated. Live weight was significantly ($p < 0.05$) higher in group T2 than other treatments. Dry matter (DM) intake also differed significantly ($p < 0.05$) among the three treatments with goats in group T2 having highest ($p < 0.05$) intake. It was concluded and suggested that West African Dwarf goats could be tethered at 185cm radius for higher performance.

INTRODUCTION

Small ruminants play important roles in improving the economy of peasant farmers especially those that cannot keep large animals. They are sources of liquid assets and saving as well as having important roles in religious, social functions, and serve as sources of foreign currency earnings (Adane and Girma, 2008). Sheep and goats are kept in the tropics under varying ecological conditions and significantly differing husbandry systems. They can survive in a broad ecological zone range including harsh environment, utilize areas unsuitable for crop production and feed on a variety of grasses, herbs and shrubs (Oyeyemi, 2002). Adaptive features such as feeding behaviour, efficient feed utilization and tolerance to diseases enable goats to thrive well on natural resources left untouched by other domestic ruminants (Moniruzzaman *et al*; 2002). However, as farming system intensifies and grazing land availability is restricted other methods of feeding ruminants are increasingly adopted such system include tethering (Sendalo *et al*; 1994) which is practiced in order to improve the effectiveness and efficiency of production. Animals in search for feed and water especially during dry season waste a lot of energy as they walk long distances as a result they lose weight thereby affect the income of the farmers (Lakpini, 2006). Nonetheless, farmers have to rear animals despite shrinkage of land, accident, urbanization, hence tethering of animals have to be adopted in order to improve

productivity and profit margin by farmers. This study was conducted to investigate the consequences of tethering on the performance of West African Dwarf goats.

MATERIALS AND METHODS

The study was carried out at Small Ruminants Unit of the Teaching and Research Farm of the College of Agricultural Sciences, Olabisi Onabanjo University, Yewa Campus Ayetoro, Ogun State. Ayetoro falls within latitude $7^{\circ}15'N$ and Longitude $3^{\circ}3'E$ in derived Savannah zone of Ogun state with an annual rainfall of 1900.3mm, maximum temperature between 29 and $34^{\circ}C$ and annual relative humidity of 81% (Onakomaiya *et al*; 1992). A total of 18 West African Dwarf goats were purchased from Ayetoro market, quarantined for 14 days during which time necessary medications were given to the animals. They were fed forages and water adlibitum, while the concentrate used was measured before been fed to the goats for 77 days. The forages and concentrate feed were analysed for their chemical composition (AOAC, 2000) initial weights of goats were taken and repeated weekly using a hanging scale. The goats tethering was done using rope as follows: 6 goats on free grazing (0cm) = T0 (control); 6 goats were tethered 91.5cm = T1; 6 goats were tethered 183cm = T2. The animals on control were grazed freely on *panicum* maximum while those in T1 and T2 were offered freshly cut some grass with cool water *ad-libitum* in the morning while whole

cassava root based concentrate was fed to the goats in the 3 treatments in the evening. The leftover of the concentrate was measured in order to obtain the quantity of food consumed by the goats. Data collected included Initial, Final, Total and Daily weights, Feed intake, Dry matter intake and Feed Conversion Ratio (FCR). All data collected were analysed using (SAS 2002) method and the significant means separated with Duncan's multiple range test of the same system.

RESULTS AND DISCUSSION

Table 1 and 2 show the ingredient composition of concentrate diet and chemical composition of forage as well as concentrate fed to the experimental animals. The two feeds were adequately rich enough to cater for the nutritional needs of the experimental goats. Table 3 shows that goats tethered at radius 183cm (T2) had highest ($p < 0.05$) final weight, total weight gain, daily weight gain, concentrate and dry matter intake followed by goats on free range with the exception of concentrate, dry matter intake and feed consumption ratio which were higher in goats tethered at radius 91.5cm. These results could be due to the fact that goats on longer radius probably had access to more forages as well as concentrate because of having ample contact with feed as well as the goats on free range, while those goats tethered at 91.5cm (T1) radius had limited contact with feed (Sendalo *et al.*, 1994). It was reported that the time spent for rumination was higher in tethered goats and they consumed more concentrate feed than grazing ones (Moniruzzaman *et al.*, 2002).

CONCLUSION

It can be concluded from the results obtained from this study that tethered WAD goats can compare favourably with those on free range if concentrated high in protein were offered to them as they showed superior body weight changes than those on free range (T0). However, WAD goats tethered at 183cm radius (T1) were able to convert feed more than those tethered at 91.5cm radius (T1). Thus WAD goats could be tethered at 183cm radius for higher performance.

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Table 1: Ingredient Composition of Concentrate diet

Ingredient	Percentage
Whole Cassava Root Meal	43.45
Groundnut Cake	16.08
Palm Kernel Cake	26.12
Rice Husk	10.45
Bone Meal	2.00
Oyster Shell	1.00
Premix	0.05
Salt	0.05

Table 2: Chemical Composition of Forage and Concentrate fed to experimental Animals

Variable	Panicum Maximum	Concentrate
Dry Matter	95.88	91.44
Crude Protein	8.14	18.01
Crude Fibre	10.36	10.25
Ether Extract	2.27	5.00
Ash	2.70	4.48
NFE	76.53	62.26

NFE = Nitrogen Free Extract

Table 3: Performance characteristics of goats tethered at different radii

Variable	Treatments			SEM
	T0	T1	T2	
Initial live weight(kg)	5.50	4.83	5.75	1.54
Final live weight(kg)	11.50 ^b	10.17 ^c	13.00 ^a	0.70
Total Weight gain(kg)	6.00 ^b	5.34 ^b	7.25 ^a	1.68
Daily Weight gain(kg)	77.92 ^b	69.22 ^c	94.16 ^a	9.75
Concentrate (g/days)	559.74 ^c	613.44 ^b	710.89 ^a	58.08
Dry Matter intake(g/day)	511.83 ^c	560.93 ^b	650.04 ^a	53.11
FCR(g/h/DAY)	6.569 ^b	8.104 ^a	6.904 ^b	1.20

abc: Means on the same row with different superscripts are statistically significant ($p < 0.05$)

FCR = Feed Conversion Ratio