

Performance of Yankassa Sheep and Savanna Brown Goats under Free Grazing and Tethering Systems of Management

T. Z. Adama¹ and H.H Mijidadi²

¹Department of Animal Production, Federal University of Technology, Minna

²Niger State Agricultural Development Project, Minna

Target Audience: Sheep and Goats rearers, Extension staff, Animal nutritionists

Abstract

Sixteen Yankassa sheep and 16 Savanna Brown goats aged between 2-3 years were used to assess the body weight and body condition of sheep and goats under free range and tethering systems of management over a period 92 days. Four experimental groups were constituted by randomly assigning 8 animals from each species to either free range or tethered system of management. Free range goats recorded the highest live weight gain of 6.15 kg followed by free range sheep with a value of 4.32 kg. Tethered goats and tethered sheep recorded relatively lower values of 1.66 and 0.90 kg respectively. The body condition gains were also higher in free range animals compared with the tethered ones with values being 0.70 free range sheep, 0.49 for free range goats, 0.03 for tethered sheep and -0.29 for tethered goats. It was concluded that for tethered animals to perform well, their diet must be adequately supplemented with good quality fodder and/or concentrate and should also be adequately protected from adverse weather conditions.

Keywords: Sheep, Goats, Body weight, Body Condition, Free range, Tethering.

Description of Problem

Free range (or extensive) and tethering are two common methods of managing small ruminants in Nigeria. Under the free range system, animals roam about freely, surviving on natural range, browse, kitchen wastes and farm crop residues. The animals are not usually provided with any housing. Tethering is the last resort in that it can mean quite a lot of work such as bringing out the animals every morning and tying them with a rope to pegs or any other support. It is also limits the movement and choice of diet of the animals. This can adversely affect their performance. Thus, a significant decline ($P < 0.05$) on growth performance of tethered goats has been reported (1). The major advantage of tethering is to avoid damage to crops during the cropping season. In spite of the possible negative effect tethering may have on the performance of grazing animals, the

tethering system is becoming increasingly important in many parts of Nigeria due to scarcity of grazing land. This scarcity is evidenced by frequent clashes between herdsmen and farmers. In this regard, tethering may provide an alternative to free range system. The aim of this study was to assess the effect of tethering system on body weight and body condition of Yankassa sheep and Savanna Brown goats.

Materials and Methods

The study was conducted between the months of June and October, 2000 within the premises of the Teaching and Research Farm of the Department of Animal Production of the Federal University of Technology (Bosso Campus) Minna, Niger State, Nigeria. Minna is located at Latitude of 9°37' North and 6°33' East. Minna, is situated in the Southern Guinea Savanna zone of Nigeria. Data

obtained from the Meteorological Station, Minna indicated that between 1952-1999, average rainfall, duration of raining season, minimum and maximum temperatures were 1247.3 mm, 200 days, 19.5 and 37.1°C respectively.

A total of 32 animals consisting of 16 Yankassa sheep and 16 Savanna Brown goats were used for the experiment. The animals were aged between 2-3 years. Their ages were determined using the method outlined by (2). Four experimental groups namely: Free range goats, Tethered goats, Free range sheep and Tethered sheep were constituted using randomised block design. Each group consisted of four males and four females.

All animals were housed in the night in an enclosed pen. The walls and the roof of the pen were made of corrugated iron sheet (*zinc*). Space was provided at the rate of 2.8 m²/animal (3). Wood shavings were provided on the floor of the pen to serve as bedding. This was changed at regular intervals of one week.

A supplementary concentrate ration of corn offal was fed to the animals every morning between 008-009Hr at an average rate of 250 g/animal. The animals were also allowed free access to water and mineral salt licks. All the animals were released from the pen at 009 Hr every day. Animals assigned to free range were allowed free access to natural pasture within the premises of the University for a period of eight hours. The characteristics and composition of the pasture has been described by (4;5). Each tethered animal was

conducted to pasture every morning and tied to a pole by means of a rope measuring 4 m. A distance of 20 m was allowed between each animal. All the animals were conducted back to the pen at 17 Hr.

The animals were routinely treated against internal and external parasites. They were dewormed twice with an anti-helminth drug (Albendazole bolus, Alved Pharma and Foods Ltd. India) which was administered orally. External parasites were controlled by dipping the animals in Asuntol (5%; Bayer Leverkusen Pharmaceutical Company).

The animals were weighed at weekly intervals using a Moris scale (Lesslie P. Moris Ltd., Dele Street, Cravenarms, Shropshire, England). Animals were starved over night and weighed the following morning before they are allowed access to feed and water. The body condition score was conducted on a scale of 0.00-5.00. Using the guidelines outlined by (6)

Data obtained from the study were subjected to analysis of variance (ANOVA) and multiple range analysis using computer package (7). Graphs were plotted using another computer package (8)

Results and Discussion

The result of the performance of the animals interns of body weight and body condition is presented in Table 1. Goats had lower initial and final live weights than sheep under free range or tethered systems of management. The initial and final body

Table 1. Body weight and body condition of Yankassa sheep and Savanna brown goats under free range and tethered systems of management.

	Goat Free Range	Goat Tethered	Sheep Free Range	Sheep Tethe.
Body Weight (kg)				
Initial Weight	16.80a	17.33a	20.80b	21.50b
Final Weight	22.95b	18.99a	25.12c	22.40c
Total Weight Gain	0.15d	1.66b	4.32c	0.90a
Weekly Weight Gain	0.47d	0.13b	0.33c	0.07a
Body Condition				
Initial Body Condition	2.48a	2.58a	2.80b	2.88b
Final Body Condition	2.97b	2.55a	3.55a	2.58a
Total Body Cond. Gain	0.49c	-0.03b	0.70d	-0.29
Mean Body Cond. Gain	0.037c	-0.002b	0.054c	-0.032a

Means in the same row with different letters are significantly different ($P < 0.05$)

Table 2. Correlation between some average weekly meteorological values and average weekly body weight and body condition score of Yankassa sheep and Savanna brown goats under free range and tethered systems of management.

Parameter	Treatment			
	Free Goat	Tethered Goat	Free Sheep	Tethered Sheep
Body Weight				
Body Weight and Temperature (C)	-0.2109	-0.5936*	-0.1053	-0.5381*
Body Weight and Evaporation (mm)	0.0630	0.2781	0.0624	0.1016
Body Weight and Rainfall (mm)	-0.1727	-0.7171**	-0.2993	-0.5208*
Body condition score				
Body Condition and Temperature (C)	-0.0164	-0.5784*	-0.1088	-0.5491*
Body Condition and Evaporation (mm)	0.0214	0.1673	0.2024	0.2180
Body condition and Rainfall (mm)	-0.0144	-0.6158**	-0.3323	-0.5462*

*Significant at $P < 0.05$

**Significant at $P < 0.01$

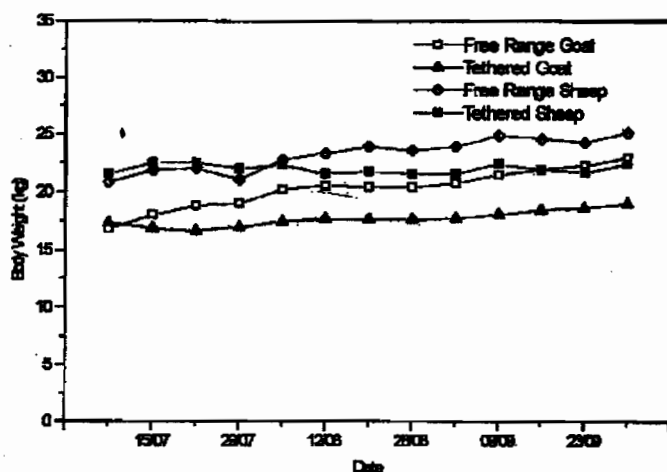


Figure 1. Weekly body weight of free range or tethered Savanna brown goats and free range or tethered Yankassa sheep

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condition scores were also lower in goats. Free range goats recorded the highest total live weight gain of 6.15 kg followed by free range sheep with a value of 4.32 kg. Tethered goats and tethered sheep recorded relatively lower values of 1.66 and 0.90

kg respectively. Weekly live weight gains were 0.47, 0.33, 0.13 and 0.07 kg for free range goats, free range sheep, tethered goats and tethered sheep respectively. The four groups of animals all showed significant differences in both total and

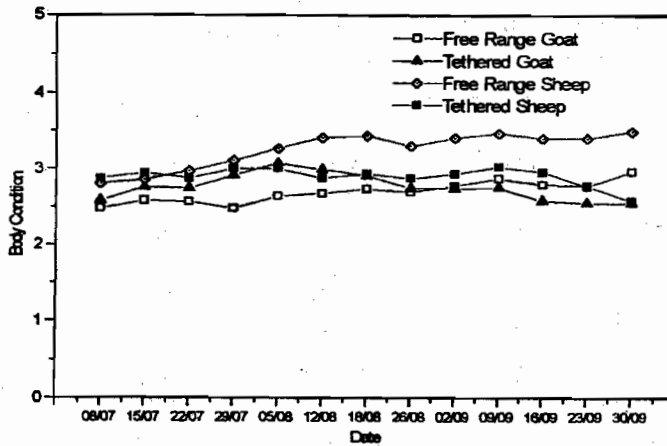


Figure 2. Weekly body condition of free range or tethered Savanna brown goats and free range or tethered Yankassa sheep

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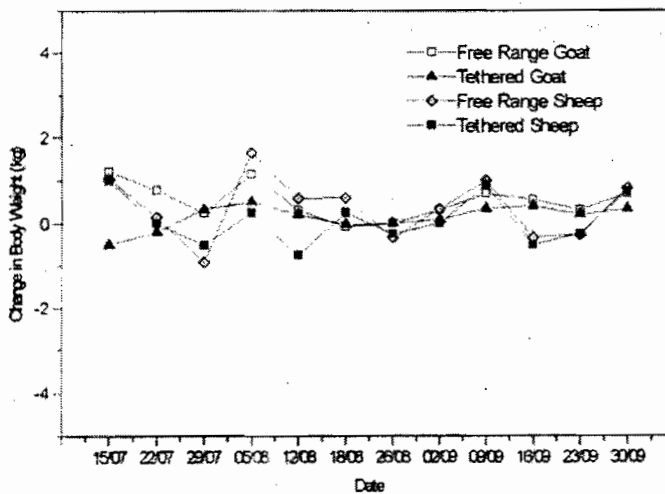


Figure 3. Weekly changes in body weight of free range or tethered Savanna brown goats and free range or tethered Yankassa sheep

Figure 3. Weekly changes in body weight of free range or tethered Savanna brown goat and free range or tethered Yankassa sheep

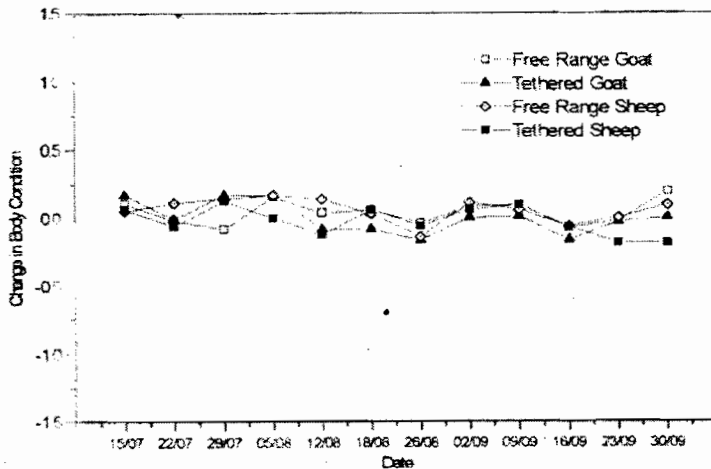


Figure 4. Weekly changes in body condition of free range or tethered Savanna brown goats and free range or tethered Yankassa sheep

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weekly live weight gains. As for the body condition, free range sheep and free range goats recorded total gains of 0.70 and 0.49 respectively. Tethered animals (both sheep and goats) recorded loss of condition with values being -0.03 and -0.29 for tethered goats and sheep respectively.

The results presented in Table 2 show that temperature and rainfall had a significantly negative effect on body weight and body condition of tethered animals. This is indicated by the high negative correlation values recorded for both tethered sheep and goats for temperature and rainfall. Evaporation rate is poorly correlated with either body weight or body condition as the correlation values were low for both sheep and goats.

The pattern of live weight and body condition of the four groups of the animals are presented in Figure 1 and 2 respectively. All the groups recorded slight weekly increases through out the experimental period (Figure 1). Both free range sheep and goats showed increases in body condition, whereas the tethered groups showed decreases (Figure 2). Weekly changes in live

weight and body condition are presented in Figures 3 and 4. The graphs indicate fluctuations in weekly changes of both live weight and body condition.

Although all the treatments experienced weight gains during the period of the experiment, the results clearly indicated the negative effect of tethering on both sheep and goats. Average weekly weight gains of free range animals were about four and five times more than those of tethered ones in goats and sheep respectively. The body condition of both tethered sheep and goats declined progressively (Figure 2) while those of the free ranged animals appreciated during the period of the study. The results of this study showed the effect of tethering on body weight and body condition gains was more pronounced in sheep than in goats. Also, because of the relatively bigger sizes of the sheep, they require more feed than the goats. The negative effect of weather condition on the performance of the animals is very clearly demonstrated in this study. Tethered animals left under the mercy of harsh weather conditions (temperature and rain) will suffer some

set back in their performance (9). The effect is usually more on goats. Thus, (10) remarked that sheep have a great deal of oil in their coats which repels the wet, but not so with goat, who gets really wet and very miserable. They further stated that under such a condition, it will take all the food consumed by goats just to keep them warm thus leaving little or nothing for production. Similarly, (1) reported that the grazing behaviour of tethered West African Dwarf goats was restricted to morning hours during hot days and that on days with heavy rains, feed intake was adversely affected thus significantly ($P < 0.05$) limiting intake. Free range animals should be able to seek protection under trees or building during adverse weather condition whereas tethered will be unable to do so.

In this study, tethering was not a viable alternative to free range grazing. To improve the performance of tethered animals, their diet must be supplemented with adequate good quality fodder and/or concentrate. The cost of concentrate may however not be within the reach of many peasant farmers. An intensive cultivation of grass and/or legume fodder crops on which tethered animals will be allowed access to will provide them with a high quality supplementary forage. Such a method have been found to be effective in increasing live weight gain (11). Another desirable managerial practice is to plant browse species for use particularly during the dry season (12).

The superiority of the free range systems over tethering has been demonstrated in this study. However, free range usually predominates where there is enough land to carter for both crop production and livestock grazing. This was the case in Nigeria in the past. In recent times, more pressure is being put to convert the grazing lands to farms, industrial estates, roads and other development projects. More than 50% of the traditional grazing reserves have been converted to farms especially in Kebbi, Sokoto, Kastina, Jigawa and Kano states (13). Since in many parts of Africa, agro-postoral systems is fast evolving towards complete sedentarization (14; 15, 16) the setting aside of specific areas for grazing purposes (17) in order to avoid clashes between farmers and herdsmen is fast becoming necessary requirement.

During the dry season, livestock may graze on stubble or crop residues (15) studying an agro-pastoral system in the sub-humid zone of Nigeria noted that the average grazing time was only 6.1 hours/day. This is probably too short a period for the cattle to obtain sufficient feed. In addition, as grazing areas are restricted and cattle are housed in the night enclosures for long periods, parasites flourish. In the early days, although there were plenty of grazing land in northern part of Nigeria, the traditional rulers still had the foresight to require reservation of several hectares for livestock to avoid unnecessary disputes between farmers and grazers (18). In eastern Nigeria, where animal movements are more restricted, a cut-and carry system is proposed (19).

It can be concluded that if tethered animals must perform well, their diet must be adequately supplemented. They should also be adequately protected from adverse weather conditions such as high temperature and rainfall.

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