GRAZING MANAGEMENT IN GOAT FARMING OF SOUTHERN AGRO-CLIMATIC REGION OF TAMILNADU

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ABSTRACT

Goat farming is an important occupation for rural landless laborers. A research work was conducted to analyze the goat farming practices adopted by farmers under field conditions in the southern agro-climatic region of Tamil Nadu. A total of 180 goat farmers were utilized for this study in 20 villages each in Tirunelveli, Thoothukudi and Virudhunagar districts. Duration of grazing of goats in the study area has been observed as more than 8 h (55.56 per cent), 6 to 8 h (23.33 per cent) and less than 6 h (17.78 per cent) grazing. Chi-square test revealed that there was no significant difference between the grazing duration and districts. A grazing period followed by the goat farmers viz., morning to evening, morning to noon and separately in the morning as well as in the afternoon were 51.11, 23.89 and 21.67 per cent, respectively. There was no significant difference between the grazing period followed by the goat farmers and districts. The distance traveled by the goats per day for grazing were categorized as less than 3 km (31.11 per cent), 3 to 5 km (19.44 per cent) and 5 to 10 km (46.11 per cent) in the study area. As per the Chi-square test, there was no significance observed between the distance covered during grazing of goats and districts. Regarding the grazing area, common property resources (51.67 per cent), harvested fields (20.56 per cent), forest or roadsides (24.44 per cent) were available for grazing of goats in southern agro-climatic region of Tamil Nadu. The Chi-square test showed that a significant ($P < 0.05$) association between the persons involved in grazing of goats and district. Chi-square test revealed that highly significant ($P < 0.01$) difference observed between the equipment held with goat farmer and district. The mean distance covered by the goat farmers during the grazing h were 4.83 ± 0.29 , 4.95 ± 0.35 and 5.43 ± 0.38 km, respectively in Tirunelveli, Thoothukudi and Virudhunagar districts. The mean overall distance of grazing allowed for goats in the study area was 5.07 ± 0.20 km. There was no significant association observed between the grazing hour and districts. The overall mean grazing duration followed in the study area was 7.03 ± 0.16 h. No significant difference was observed between the mean duration of grazing and districts.

KEYWORDS: Goat Farming, Grazing Management & Tamil Nadu

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INTRODUCTION

Goat farming makes a valuable contribution to rural poor where they are kept in small pens near the house and fed on by-products and branches of trees from which they eat the leaves and barks (Orskov, 2011). Goat farming is an important occupation for rural landless laborers. Goats are considered as a mobile bank and often termed mortgage -lifter for the weakest section of society and ray of hope in the areas where agriculture is not economically viable and ecologically sustainable. Grazing systems supply about 30 per cent of the world's

production of sheep and goat meat. Due to shrinking of grazing land, maintaining the goats on grazing may not sustain and goat keeping should be gradually switched over to a strategic semi-intensive system of management. The profitable goat production can be achieved by optimizing the use of highquality forage and the strategic use of balanced concentrate feed and good management practices. Tamil Nadu state is endowed with two breeds of goats recognized by National Bureau of Animal Genetics Resources viz., Kanni Adu and Kodi Adu which are reared in different agro-climatic regions and showed great variation in production and reproduction performances (Acharya, 1982).

MATERIALS AND METHODS

The study was carried out in southern agro-climatic regions viz., Tirunelveli, Thoothukudi and Virudhunagar districts of Tamil Nadu to document the existing grazing management farming practices adopted by goat farmers. The villages were selected in consultation with the Department of Animal Husbandry of the Tirunelveli, Thoothukudi, and Virudhunagar districts on the basis of goat population existing there and goat herds were selected at random.

A total of 180 goat herds from 60 villages spread in 30 blocks in three districts (Tirunelveli, Thoothukudi, and Virudhunagar) were selected using multi-stage random sampling technique. The details on the place of grazing, duration of grazing, distance covered during grazing, watering provisions during grazing were recorded. The data collected were subjected to descriptive statistics, correlation tests and least square analysis (Harvey, 1990). Data obtained were analyzed by applying an analysis of variance under completely randomized design (CRD).

RESULTS AND DISCUSSIONS

Duration of grazing of goats in the study area has been observed as more than 8 h (55.56 per cent), 6 to 8 h (23.33 per cent) and less than 6 h (17.78 per cent) grazing. Farmers involved in an intensive system of rearing of goats (3.33 per cent) did not follow grazing. Chi-square test revealed that there was no significant difference between the grazing duration and districts. Grazing period followed by the goat farmers viz., morning to evening, morning to noon and separately in morning as well as in afternoon were 51.11, 23.89 and 21.67 per cent, respectively. In line with this, Nandi *et al.* (2011) reported that more than 96.60 per cent of the goat farmers practiced morning to noon grazing where as only 3.40 per cent of them allowed their animals for grazing separately in morning and afternoon for Black Bengal goats in West Bengal.

Regarding the grazing area, common property resources (51.67 per cent), harvested fields (20.56 per cent), forest or roadsides (24.44 per cent) were available for grazing of goats in a southern agro-climatic region of Tamil Nadu. There was a significant ($P < 0.05$) association between the grazing area and district.

Men, children, and women engaged in grazing the goats in the study area were categorized as 61.11, 18.33, and 17.23 per cent, respectively. The Chi-square test showed that a significant ($P < 0.05$) association between the persons involved in grazing of goats and district. Goat farmers carried a long stick (42.22 per cent), large knife (25.56 per cent) and stick with the knife (28.89 per cent) during the grazing time to lop the tree fodders for goats in the study area. Chi-square test revealed that highly significant ($P < 0.01$) difference observed between the equipment held with goat farmer and district.

A majority of the goat farmers was not allowing the sick animals (43.90 per cent) for grazing followed by young kids (39.44 per cent). Some of the goat farmers did not allow weak animals for grazing (16.66 per cent). There was no significance observed between the category of goats not allowed for grazing and districts. Distance

travelled by the goats per day for grazing were categorized as less than 3 km (31.11 per cent), 3 to 5 km (19.44 per cent) and 5 to 10 km (46.11 per cent) in the study area. As per the Chi-square test, there was no significance observed between the distance covered during grazing of goats and districts.

The mean distance covered by the goat farmers during the grazing h was 4.83 ± 0.29 , 4.95 ± 0.35 and 5.43 ± 0.38 km, respectively in Tirunelveli, Thoothukudi and Virudhunagar districts. The mean overall distance of grazing allowed for goats in the study area was 5.07 ± 0.20 km. Jain *et al.* (2000) reported that the goat farmers in southern districts of Tamil Nadu covered about 7 to 8 km daily during grazing.

There was no significant association observed between the grazing hour and districts. The mean grazing duration followed was 6.77 ± 0.25 , 7.23 ± 0.33 and 7.10 ± 0.27 h in Tirunelveli, Thoothukudi and Virudhunagar districts, respectively. The overall mean grazing duration followed in the study area was 7.03 ± 0.16 h. No significant difference was observed between the mean duration of grazing and districts. In accordance with these findings, Singh and Rai (2006) observed more than 65 per cent of the farmers primarily raised their goats on browsing of shrubs and forest leaves with 6 to 8 h grazing under an extensive system of management. The nutrient intake was based on the duration (h) of grazing followed by the farmers and seasonal availability of the tree fodders and foliages.

The major foliages available in the grazing location of Tirunelveli district were *Cynodon dactylon*, *Brachiaria mutica*, *Echinochola colona*, *Acalypha indica* and *Phyllanthus reticulatus* and they were present in 36.67, 33.33, 8.33, 11.67 and 10.00 per cent, respectively in grazing area. The major foliages available in the grazing location of Thoothukudi district were *Digitaria sanguinalis*, *Corchorus olitorius*, *Merremia emerginata*, *Trianthema portulacastrum* and *Ziziphus mauritiana* and they were present in 41.67, 35.00, 8.33, 10.00 and 5 per cent, respectively in grazing area. The major foliages available in the grazing location of Virudhunagar district were *Dactyloctenium aegyptium*, *Digeria agvensis*, *Cyperus rotundus*, *Cassia auriculata* and *Abubilon indicum* as 31.67, 18.33, 13.33, 15.00 and 21.67 per cent, respectively in grazing area

Table 1: Grazing Management (Percent) Followed by the Goat Farmers in Southern-Agro Climatic Region of Tamil Nadu

Particulars	Category	District			Overall	Chi-Square
		Tirunelveli	Thoothukudi	Virudhunagar		
Grazing Duration (h)	More than 8 hrs	53.33 (32)	58.33 (35)	55.00 (33)	55.56 (100)	10.40 ^{NS}
	6- 8 hrs	15.00 (9)	23.33 (14)	31.67 (19)	23.33 (52)	
	Less than 6 hours	28.33 (17)	13.33 (8)	11.67 (7)	17.78 (32)	
	Not allowed for grazing	3.33 (2)	5.00 (3)	1.67 (1)	3.33 (6)	
Grazing Period	Morning to evening	53.33 (32)	56.67 (34)	43.33 (26)	51.11 (92)	8.26 ^{NS}
	Morning to noon	15.00 (9)	21.67 (13)	35.00 (21)	23.89 (43)	
	Separately in morning and afternoon	28.33 (17)	16.67 (10)	20.00 (12)	21.67 (39)	
	Not allowed for grazing	3.33 (2)	5.00 (3)	1.67 (1)	3.33 (6)	

Table 1: Contd.,						
Grazing Distance (km)	Less than 3 km	30.00 (18)	28.33 (17)	35.00 (21)	31.11 (56)	3.74^{NS}
	3 - 5 km	15.00 (9)	25.00 (15)	18.33 (11)	19.44 (35)	
	5-10 km	51.67 (31)	41.67 (25)	45.00 (27)	46.11 (83)	
	Not allowed for grazing	3.33 (2)	5.00 (3)	1.67 (1)	3.33 (6)	
Grazing Area	Common property resources	41.67 (25)	58.33 (35)	55.00 (33)	51.67 (93)	16.59[*]
	Harvested fields	36.67 (22)	8.33 (5)	16.67 (10)	20.56 (37)	
	Road side areas	18.33 (11)	28.33 (17)	26.67 (16)	24.44 (44)	
	No grazing	3.33 (2)	5.00 (3)	1.67 (1)	3.33 (6)	
Grazed by	Men	60.00 (36)	53.33 (32)	70.00 (42)	61.11 (110)	16.44[*]
	Children	28.33 (17)	11.67 (7)	15.00 (9)	18.33 (33)	
	Women	8.33 (5)	30.00 (18)	13.33 (8)	17.23 (31)	
	No grazing	3.33 (2)	5.00 (3)	1.67 (1)	3.33 (6)	
Equipment used During Grazing	Long stick	51.67 (31)	55.00 (33)	20.00 (12)	42.22 (76)	24.54^{**}
	Large sickle	25.00 (15)	11.67 (7)	40.00 (24)	25.56 (46)	
	Stick with sickle	20.00 (12)	28.33 (17)	38.33 (23)	28.89 (52)	
	No grazing	3.33 (2)	5.00 (3)	1.67 (1)	3.33 (6)	
Category of Animals not Allowed for Grazing	Sick animals	41.67 (25)	43.33 (26)	46.67 (28)	43.90 (89)	6.94^{NS}
	Young kids	40.00 (24)	48.33 (29)	30.00 (18)	39.44 (71)	
	Weak animals	18.33 (11)	8.33 (5)	23.33 (14)	16.66 (30)	

Figures in parentheses indicate number of observations * Significant ($P < 0.05$) ** Highly significant ($P < 0.01$) ^{NS}

Non-significant

Table 2: Least-Squares Means ($\pm$ SE) of Distance Covered and Duration of Grazing of Goats in Southern Agro-Climatic Region of Tamil Nadu

Parameter	District			Overall
	Tirunelveli	Thoothukudi	Virudhunagar	
Grazing Distance (km)	4.83 $\pm$ 0.29 (60)	4.95 $\pm$ 0.35 (60)	5.43 $\pm$ 0.38 (60)	5.07 $\pm$ 0.20^{NS} (180)
Grazing Duration (hrs)	6.77 $\pm$ 0.25 (60)	7.23 $\pm$ 0.33 (60)	7.10 $\pm$ 0.27 (60)	7.03 $\pm$ 0.16^{NS} (180)

Figures in parentheses indicate number of observations ^{NS} Non-significant

SUMMARY AND CONCLUSIONS

From this study, the grazing management followed by the goat farmers in southern Tamil Nadu has completely studied. The common property resources (51.67 per cent), harvested fields (20.56 per cent), forest or roadsides (24.44 per cent) were mainly used as a grazing area for goats. Men, children, and women were engaged in grazing the goats in the study area in 61.11, 18.33, and 17.23 per cent, respectively. The mean duration of grazing and distance traveled for grazing of goats by the farmers in the study area were 7.03 ± 0.16 h and 5.07 ± 0.20 km, respectively. Between systems of management, a significant difference ($P < 0.05$) was observed in body weight (kg) at 6 months, the highly significant difference ($P < 0.01$) was found in 12 months age group. In an intensive system, the rate of weight gain was more at 6 months age since lack of movement favors more weight gain. But, 12 months body weight was higher in the extensive system due to the chances of consuming varieties of nutritious roughages in grazing. Availability of foliages in the grazing area contributed the performance of the goats. Identification of nutrient contents in the available foliages in the grazing area plays the major role and it should be communicated to the goat farmers for its importance.

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