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Anjali A Jambhunkar

Department of Livestock
Production and Management,
Nagpur Veterinary College,
Maharashtra Animal and Fishery
Sciences University, Nagpur,
Maharashtra, India

Jeevan M Chahande

Department of Livestock
Production and Management,
Nagpur Veterinary College,
Maharashtra Animal and Fishery
Sciences University, Nagpur,
Maharashtra, India

Corresponding Author:

Anjali A Jambhunkar

Department of Livestock
Production and Management,
Nagpur Veterinary College,
Maharashtra Animal and Fishery
Sciences University, Nagpur,
Maharashtra, India

Labour kinetics of growing Berari goats under different rearing systems

Anjali A Jambhunkar and Jeevan M Chahande

Abstract

Labour kinetics holds paramount importance in the successful operation of a goat farm, influencing various aspects ranging from daily care routines to long-term strategic management. For the present study, 24 growing Berari goats were selected and divided into Intensive, Semi-intensive, and Extensive groups of rearing systems with eight goats in each group. The labour kinetics was determined by recording the time required by the labour to perform different farm activities from the entry into the farm till the exit at weekly interval for 91 days. Maximum time was spent by the labour on the grazing of the goat in an extensive system (480.00 min) and semi-intensive system (240.00 min), however, this is not practiced in the intensive system and thus maximum workload is conserved. The time spent by the labour was maximum in the extensive system (506 min & 21 seconds/day), followed by the semi-intensive (392 min & 20 seconds/day) and the least in the intensive system (156 min & 19 seconds/day). Thus, the intensive system is more labour-friendly, followed by the semi-intensive and extensive system.

Keywords: Berari goats, farm activities, intensive, labour kinetics

Introduction

Goats also referred to as "ATM" (Any Time Money), are thought to be the greatest option for rural farmers in developing nations because they enhance household nutrition, assist in meeting emergency financial needs, increase capital storage, and make the best use of family labour and self-employment (Pandey *et al.*, 2015) [6]. For smallholder and marginal farmers in rural areas, goat farming has the potential to be a very effective source of income, jobs, and food, particularly in less favourable conditions (Lata and Mondal, 2021) [2]. According to the 20th Livestock Census (2019) [1], there are 536.76 million livestock animals in India, of which 148.88 million are goats, comprising 142.44 and 6.44 million rural and urban goat populations, respectively. This indicates that 27.74% of the livestock in the nation are goats. Three types of rearing systems for small ruminants have generally been practiced in the, cookies are country, *i.e.*, extensive (free-range), intensive (stall feeding), and semi-intensive with supplementation (Mohini *et al.*, 2018) [3].

Labour kinetics holds paramount importance in the successful operation of a goat farm, influencing various aspects ranging from daily care routines to long-term strategic management. Efficient labour management ensures the smooth execution of essential tasks, contributing significantly to the overall profitability of the farm. Labour kinetics is integral to the success of a goat farm across various operational dimensions. By optimizing labour resources and ensuring effective management practices, farmers can enhance productivity, uphold animal welfare standards, mitigate risks, and achieve sustainable growth and profitability in goat farming enterprises. Various management activities carried out at the farm determine how many workers are needed for a goat farm. The organization and management of labour resources in our country impact the efficient use in terms of money and materials allocated to goat farming since labour is either underutilized or overutilized. "Berari" is one of the populations of indigenous goats that exists in the Vidarbha region of Maharashtra, and Nimar district of Madhya Pradesh. It is recognized as the 23rd goat breed of India (INDIA_GOAT_1100_BERARI_06023) (NBAGR, 2013) [4]. The present study was undertaken to investigate the labour efficiency of each system of Berari goat rearing.

Materials and Methods

The present study was undertaken at the Department of LPM, Nagpur Veterinary College, Nagpur, and Punyashloka Ahilyadevi Sheep and Goat Farm at Bondri, Ramtek, Maharashtra, India, for a total duration of 91 days (12 weeks and 14 observations). For the study, 24 growing Berari goats of about six months of age were selected and the general health conditions of the goats were examined. The selected goats were divided into three groups, *viz.*, Intensive group (T₀), Semi-intensive group (T₁), and Extensive group (T₂) of goat rearing systems with eight goats in each group. The goats in the T₀ group were fed with concentrate 1% of the body weight and roughages 100 % of the requirement. T₁ was provided with a concentrate of 1% of the body weight and roughages 50 % of the requirement along with 4 h of grazing. The T₂ group was grazed for 8 h a day without any stall feeding.

In all three groups, the growing goats provided a covered area of 6.53 m² per animal, on an average. Goats in the intensive

rearing system were given 14.84 m² of open room for unrestricted movement. For the duration of the trial, feeder and water arrangements were constructed in each shed and kept hygienically. Every day, the sheds were cleaned, and lime was put to the floor of the sheds and the walls up to one metre in height every two weeks.

The labour kinetics was determined by recording the time required by the labour to perform different farm activities from the entry into the farm till the exit. The various farm activities (n=22) taken into consideration were as shown in Table 1. The time required/spent/taken for each of this activity was observed at a weekly interval (14 observations) for each of the rearing system and the average time required by the labour to perform all the activities in a day was calculated.

Results and Discussion

Labour kinetics is one aspect that helps in understanding how labour will interact with various aspects of farm operations.

Table 1: Average time (min) required for various activities in T₀, T₁ and T₂ groups of goat rearing following 91 days and 14 observations

Sr. No	Activities	Rearing system time (min)		
		T ₀	T ₁	T ₂
1	Time needed by the labour to count the goats after his arrival at the farm (morning)	2.07	1.42	1.64
2	Checking of the sick animal (if any)	2.75	2.50	2.15
3	Half of the daily concentrate feeding	7.64	6.32	-
4	Green roughages feeding (morning)	7.78	7.32	-
5	Dry roughages feeding (morning)	7.42	6.39	-
6	Watering of the goats	9.85	9.00	8.64
7	Collection of the leftover feed	4.35	3.75	-
8	Cleaning of the shed	12.35	12.14	-
9	Cleaning the open space	12.35	11.39	-
10	Collection of the waste from ground	2.17	1.92	-
11	Disposal of manure	4.42	4.21	-
12	Cleaning of feeder	7.57	7.00	10.00
13	Washing of waterer	7.03	6.39	6.17
14	Releasing the animals for grazing	-	2.00	2.03
15	Grazing the goats	-	240.00	480.00
16	Receiving the goats after grazing and their counting	-	5.71	5.72
17	Feeding remaining half of the daily concentrate	6.00	5.64	-
18	Green roughages feeding (evening)	6.64	6.39	-
19	Dry roughages feeding (evening)	6.71	7.21	-
20	Preparation of green fodder	24.00	24.07	-
21	Preparation of dry fodder	23.57	21.76	-
22	Miscellaneous activities	11.00	10.00	9.16

Table 1 represents the average time required by the labour to perform various activities in the intensive, semi-intensive and extensive system. From the table it can be noted that the maximum time was spent by the labour on the grazing of the goat in extensive system (480.00 min) and semi-intensive system (240.00 min), however this is not practised in the intensive system and thus maximum workload is conserved. In the intensive system and semi-intensive system most of the time was spent on the preparation of the green and dry fodder, followed by the cleaning of the shed (12.35 min in T₀) and (12.14 min in T₁) and cleaning of the open space (12.35 min in T₀) and (11.39 min in T₁). In the intensive activities such as releasing of animals for grazing, grazing the goats and receiving the goats after grazing and their counting are not performed, thus maximum time of the labour is saved. In the extensive system there is no workload of feeding the animals and cleaning of the shed and open space and thus time is conserved. Due to no grazing in T₀, maximum workload of the labour is conserved, thus the intensive system is more labour friendly.

Table 2: Average of total time (min) required by the labour to perform various activities in different goat rearing systems

Weeks	Different Management Systems		
	T ₀ (min)	T ₁ (min)	T ₂ (min)
I	177	414	511
II	173	405.5	506.5
III	156.5	393.5	510
IV	177	414	511
V	117.5	377.5	512.5
VI	176	399.5	507
VII	159.5	393.5	504
VIII	157.5	376.08	499
IX	163	397.5	506.5
X	149	386.5	505
XI	155.5	396.5	507
XII	144.5	383.5	501
XIII	137.5	373	505
XIV	145	382	503.5
	156.321 ± 4.54	392.327 ± 3.54	506.357 ± 1.03
	156 min & 19	392 min & 20	506 min & 21
	seconds	seconds	seconds

Table 2 shows that the total time spent by the labour for 14 observations was maximum in the extensive system (506 min & 21 seconds/day), followed by the semi-intensive (392 min & 20 seconds/day) and the least in the intensive system (156 min & 19 seconds/day). The results of the study are similar to that of Ruiz *et al.* (2011)^[7], who found that maximum time was spent on grazing (5.9±2.5 h/day) and nil for indoor systems.

Sreedhar and Ranganadham (2009)^[9] reported that the time required for the various operations in calves and heifers shed was 11.67 ± 0.99 and 20.10 ± 0.37 man-minutes per animal per day, respectively. These values are lower than that found in the present study on goats. The results of the study are in odd with the findings of Sathiyabarathi *et al.* (2015)^[8], which reported less time for various job procedures than those found in the current study. In contrast to the finding of the current study, which indicates that the labour requirement for the extensive system was greater than that of the intensive system, Panda and Samanta (2018)^[5] observed that the total labour requirement was lower in loose cow sheds than in tied stalls.

Conclusion

From the study it can be concluded that the labour is the critical resource for the goat farming. The maximum time of the labour is spent on the grazing of the goat, which is saved in the intensive system, thus making it labour efficient. The time spent by the labour was maximum in the extensive system (506 min/day), followed by the semi-intensive (392 min/day) and the least in the intensive system (156 min/day). Thus, the intensive system of goat rearing is more labour friendly, followed by the semi-intensive and extensive system.

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Conflict of Interest: None

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