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Growth, Productive and Reproductive Performance of Goats in Tribal Areas of Rajasthan

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Abstract

The aim of present study was to assess Growth, Productive and Reproductive Performance of Goats in Tribal Areas of Rajasthan. A total of 120 tribal goat farmers were selected from 12 villages of 6 blocks in 3 tribal dominated districts viz., Banswara, Dungarpur and Udaipur. Ten farmers from each village were selected purposively based on the number of goats. The average body weight at birth, 3 months, 6 months, 9 months and 12 months of age were 2.48 ±0.05, 12.10 ±0.15, 16.63 ±0.29, 21.11 ±0.28 and 25.92 ±0.13 kg/ in male goat respectively, whereas, in females, it was 2.01 ±0.04, 10.85 ± 0.14, 16.79 ±0.27, 20.16 ±0.15 and 23.43 ±0.15 kg/female goat, respectively. The ADG in males goats in the farmers flock from birth to 3 months, 3- 6 months, 6-9 months, 9-12 month and overall birth to 12 months were 99.99, 64.41, 52.63, 45.41 and 65.61 gm respectively, whereas, in females, values of ADG from birth to 3 months, 3 - 6 months, 6-9 months, 9-12 month and overall (birth to 12 month) were 95.59, 66.78, 45.63, 46.48 and 63.62 (gm), respectively. The overall daily milk yield (ml/goat), total lactation yield (lit), lactation length (days) and weight of buck at sale (kg) was 608.41 ±10.62, 75.73 ±0.81, 137.27 ±2.66 and 25.40 ±0.35, respectively. The overall service period (days), dry period (days), kidding interval (days) and gestation period (days) and age at first kidding (months) was 123.85±1.81, 65.17±1.36, 218.05±2.87, 148.65±1.12 and 18.24±0.15 respectively.

Keywords: Goat Farming, Growth, Productive Performance, Reproductive Performance, Tribal Area

Introduction

Goats are the world's oldest and among the first ruminants to be domesticated by human beings in South-Western Asia (Iran and Iraq) between 10000- and 6000-years BC. Around 59.78 % per cent of global goat population is in Asia and 33.8 % in Africa Continent (Aziz, 2010) i.e., in the developing countries. Among them, India having 148.88 million goats population, goats account for 27.74 per cent of the total livestock (20th Livestock Census, 2019). They provide food and nutritional security to the millions of marginal and small farmers and agricultural labourers by providing animal protein through meat and milk. There are about 34 well defined and recognized breeds of goats in India (NBAGR, 2020). Goats are among the main meat-producing animals in India, whose meat (chevon) is one of the choicest meats having huge domestic demand. Besides meat, goats, a multi-functional/purpose animal which provide other products like milk, skin, fibre and manure. Goat contributed 5.05 million tones of milk (3.67% of total milk production of 137.685 million tons) and 0.97 million tones of meat (15.56% of total production) during the year 2013-2014 (BAHS, 2015).

In India, Rajasthan is ranked first in goat population with a population of 20.80 million, (36.61%) of total livestock population in the state (20th Livestock Census, 2019). Sirohi goat is the most preferred goat breed over other breeds in Rajasthan (Marwari and Jhakhrana). Goats are the backbone of rural economy particularly, in the arid, semi-arid and mountainous regions of Rajasthan. Goat farming is a suitable option for revenue generation for the small-scale farmers and tribal people as it requires a very low investment and can efficiently survive and sustain sparse vegetation and extreme climatic conditions. Best known as the "**poor man's cow"** or "**mini cow"** these magnificent animals are the best alternative source of additional income and milk contributing immensely to the poor man's economy. In pastoral and agricultural subsistence societies in India, goats are kept as a source of an insurance against disaster. Goats are generally managed under extensive production system and semi-intensive system, where only at night shelter is provided. A major part of their fodder requirement is met out through grazing at waste and other common community lands.

India is a conventional home for about 645 tribal communities (population census, 2011). They are dispersed in almost all the states and union territories. The areas populated by tribals are mostly underdeveloped. They mostly reside in secluded villages or hamlets. The population of tribal in the country is 104 million, which is 8.2 per cent of the total population of the country whereas; the Scheduled Tribe (ST) population of Rajasthan State is 7,097,706 constituting 8.4 percent of the total ST population of India (Census, 2011). The Scheduled Tribes of the State constitute 12.6 percent of the total population (68548437) of the state. According to the 20th Livestock census, 2019 goats population in the districts of Banswara, Dungarpur and Udaipur which have been categorized as tribal districts in Rajasthan state (study area) is 36.52% of the total livestock population in Rajasthan.

Materials and Methods

In Rajasthan, tribal goat farmers predominantly reside in the districts of Banswara, Dungarpur and Udaipur. The data were collected from farmers of these districts. The body weights of available kids/goat lings were recorded on farm using a spring balance with respect to body weight at birth, 3, 6, 9 and 12 months of age separately in case of male and females. The performance data were taken as follows schedules:

Table 1: Growth performance of goats

S. No.	Age Group	Sex	Measurement
1	Birth	Male	On Farm measurement
		Female	
2	3 months	Male	
		Female	
3	6 months	Male	
		Female	
4	9 months	Male	
		Female	
5	12 Months	Male	
		Female	

Table 2: Production performance of goats

S. No.	Traits	Measurement
1	Daily milk yield (ml/goat/)	Test day recording on the farm
2	Total lactation yield (lit)	
3	Lactation length (days)	
5	Weight of buck and goats at sale (kg)	

Table 3: Reproductive performance of goats

S. No.	Traits	Measurement
1	Service period (days)	Through interview schedule
2	Dry period (days)	
3	Kidding interval (days)	
4	Gestation period (days)	
5	Age at first service (days)	

Results and Discussion

Growth Performance

A perusal of data in the Table 4 indicated that, the average body weight at birth, 3 months, 6 months, 9 months and 12 months of age were 2.48 ± 0.05, 12.10 ± 0.15, 16.63 ± 0.29, 21.11 ± 0.28 and 25.92 ± 0.13 kg/ in male goat respectively, whereas, in females, it was 2.01 ± 0.04, 10.85 ± 0.14, 16.79 ± 0.27, 20.16 ± 0.15 and 23.43 ± 0.15 kg/female goat, respectively.

Table 4: Average growth performance of goats in study areas

Age of animal	Small size flocks	Medium sized flocks	Large sized flocks	Overall
Males				
Birth weight (kg)	2.52 ± 0.06	2.46 ± 0.12	2.40 ± 0.16	2.48 ± 0.05
3 months (kg)	12.17^{c} ± 0.14	11.86^{b} ± 0.22	10.35^{a} ± 0.25	12.10 ± 0.15
6 months (kg)	17.06^{c} ± 0.21	16.03^{b} ± 0.25	15.53^{a} ± 0.54	16.63 ± 0.29
9 months (kg)	22.06^{b} ± 0.16	21.81^{b} ± 0.24	20.85^{a} ± 0.26	21.11 ± 0.28
12 months (kg)	26.28^{b} ± 0.12	25.97^{b} ± 0.21	24.73^{a} ± 0.37	25.92 ± 0.13
Female				
Birth weight (kg)	2.10^{a} ± 0.05	1.94^{b} ± 0.07	1.87^{a} ± 0.10	2.01 ± 0.04
3 months (kg)	11.01^{b} ± 0.15	11.28^{c} ± 0.25	9.48^{a} ± 0.13	10.85 ± 0.14
6 months (kg)	17.83^{c} ± 0.19	16.30^{b} ± 0.16	15.67^{a} ± 0.40	16.79 ± 0.27
9 months (kg)	21.82^{c} ± 0.15	20.02^{b} ± 0.19	19.46^{a} ± 0.26	20.16 ± 0.15
12 months (kg)	24.82^{c} ± 0.15	23.02^{b} ± 0.19	22.46^{a} ± 0.26	23.43 ± 0.15

Means bearing different superscripts in a row differ significantly

The growth performance in male and female both was significantly (p<0.05) higher in small group of farmers followed by medium and large group of farmers among all goats category as body weight at birth, 3 months, 6 months, 9 months and 12 months. Similar results were found by Tyagi *et al.* (2013), Patil *et al.* (2013), Bhakar *et al.* (2015) and Waiz *et al.* (2018). Higher growth performance in goats of small groups of flocks may be due to better feeding, health and management.

Average Daily Gain (ADG) of Goats in Study Areas

The average daily gain (ADG) in males goats in the farmers flock from birth to 3 months, 3- 6 months, 6-9 months, 9-12 month and overall birth to 12 months were 99.99, 64.41, 52.63, 45.41 and 65.61 gm respectively, whereas, in females, values of ADG were 95.59, 66.78, 45.63, 46.48 and 63.62 (gm), respectively.

Table 5: Average daily gain (ADG) of goats in study areas

Age of animal	Small size flocks	Medium sized flocks	Large sized flocks	Overall
Males body weight (gram)				
Birth to 3 months	107.22	104.44	88.33	99.99
3 - 6 months	76.33	60.33	56.56	64.41
6 - 9 months	55.56	54.22	49.11	52.63
9 - 12 months	46.89	46.22	43.11	45.41
Overall (Birth to 12 months)	71.25	66.3025	59.2775	65.61
Females body weight (gram)				
Birth to 3 months	103	99.22	84.56	95.59
3 - 6 months	75.77	68.78	55.78	66.78
6 - 9 months	56.56	43.77	36.56	45.63
9 - 12 months	51.11	46.66	41.67	46.48
Overall (Birth to 12 months)	71.61	64.6075	54.6425	63.62

Production Performance

A perusal of data in the Table 6 indicated that the overall daily milk yield (ml/goat), total lactation yield (lit), lactation length (days) and weight of buck at sale (kg) was 608.41 ± 10.62, 75.73 ± 0.81, 137.27 ± 2.66 and 25.40 ± 0.35, respectively. Daily milk yield (ml/goat), total lactation yield (lit) and weight of buck at sale (kg) was found to be significantly (p<0.05) higher in small group of farmers followed by medium and large group of farmers. The lactation length (days) in goat of small group was significantly (p<0.05) higher than large group of farmers whereas among medium group of farmers, the difference was not significant. Our results are in agreement with Patodiya *et al*. (2005), Kharkar *et al*. (2014) and Patel and Pandey (2013) who also observed similar findings. Better productive performance in goats of small group of farmers may be attributed to better feeding, housing, health and overall management in goat of small group of farmers.

Table 6: Average productive performance of goats in study areas

S. No.	Trait	Small	Medium	Large	Overall
		N = 30	N = 20	N = 10	N = 60
1	Daily milk yield (ml/goat)	614.5^{c} ±13.21	594.16^{b} ±11.26	489.58^{a} ± 23.30	608.41± 10.62
2	Total lactation yield (lit)	85.34^{b} ± 0.90	81.37^{b} ± 1.39	65.04^{a} ± 1.53	75.73± 0.81
3	Lactation length (days)	139.65^{b} ±5.09	137.19^{ab}±1.50	133.83^{a} ± 2.20	137.27± 2.66
4	Weight of buck at sale (kg)	27.06^{c} ± 0.42	24.42^{b} ± 0.57	22.75^{a} ± 0.82	25.40± 0.35

Means bearing different superscripts in a row differ significantly

Reproductive Performance

The mean (±SE) values of reproductive performance of goats have been presented in Table 7. Overall service period (days), dry period (days), kidding interval (days) and gestation period (days) and age at first kidding (months) was 123.85±1.81, 65.17±1.36, 218.05±2.87, 148.65±1.12 and 18.24±0.15 respectively.

Table 7: Average reproductive performance of goats

Traits	Respondents (n =120) Mean ± SE			
	Small (60)	Medium (36)	Large (24)	Overall
Service period (days)	116.03^{a}±2.08	127.22^{b}±3.19	138.33^{c}±4.24	123.85±1.81
Dry period (days)	59.05^{a}±1.52	70.75^{b}±2.49	72.12^{b}±3.28	65.17±1.36
Kidding interval (days)	205.28^{a}±2.96	220.27^{b}±3.47	235.17^{c}±9.24	218.05±2.87
Gestation period (days)	147.58±2.22	149.75±0.46	149.67±0.43	148.65±1.12
Age at first kidding (months)	18.01±0.24	18.41±024	18.54±0.30	18.24±0.15

Means bearing different superscripts in a row differ significantly

It is evident from the table that the three reproductive parameters *viz.* service period, dry period and kidding interval were found to be significantly (p<0.05) lower (reflecting better performance) in goats of small group of farmers as

compared to medium and large group of farmers. Our results are in agreement with those reported by Patodiya *et al*. (2004), Patodiya *et al*. (2005), Patel and Pandey (2013) and Kharkar *et al*. (2014). Better reproductive performance in small group and medium group of farmers might be attributed to better feeding, housing, health and overall management in these groups of farmers.

Conclusion

The present study concludes that Growth, Productive and Reproductive Performance of Goats was better in small group of farmer flocks due to better feeding and healthcare management thus best suited in Tribal Areas of Rajasthan.

Conflict of Interests

There is no conflict of interest.

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