

Growth, Production and Reproduction Performance of Mehsana Goat

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Abstract

The present study was conducted to evaluate the production and reproduction performance of Mehsana goats and growth performance of their offspring under farm condition. Data pertaining to growth traits of 381 Mehsana kids born during the years 2007 to 2010 and production and reproduction performance of does maintained at Sheep-Goat Research Station, Sardarkrushinagar Dantiwada Agricultural University, Sardarkrushinagar, India were analyzed. The overall means for body weight at birth, weaning (3 months), 6 months, 9 months and 12 months were observed to be 2.81 ± 0.02 , 9.92 ± 0.11 , 13.24 ± 0.16 , 15.70 ± 0.21 , and 19.23 ± 0.24 kg, respectively, whereas, daily weight gain (gm) from birth to weaning (ADG-I) and weaning to six months (ADG-II) were found to be 76.91 ± 1.12 and 40.05 ± 1.35 gm, respectively. The type of birth revealed better growth in kids born as single up to weaning, however, its reverse was true for kids born as twins which had comparatively higher weight gain during post weaning period. The overall means for production and reproduction performance traits, viz., total lactation milk yield, peak yield, days to attain peak yield, lactation length, dry period, weight at first mating, age at first service, service period, weight at first kidding, gestation period, age at first kidding, weight at kidding and kidding interval were estimated to be 70.23 ± 1.37 kg, 0.580 ± 0.01 kg, 156.23 ± 3.72 days, 224.00 ± 4.19 days, 112.31 ± 6.64 days, 26.00 ± 0.50 kg, 560.43 ± 20.83 days, 209.66 ± 2.90 days, 28.19 ± 0.45 kg, 148.97 ± 0.28 days, 716.52 ± 19.01 days, 31.58 ± 0.29 kg and 364.40 ± 4.32 days, respectively. The overall means for Fat, SNF and Protein contents in the goat milk were 3.17 ± 0.02 %, 8.32 ± 0.01 % and 3.13 ± 0.01 %, respectively.

Keywords: age at first mating, weaning, lactation length, Mehsana breed, goat

Introduction

Goat contribution is being the source of revenue for livestock-keepers, especially for family unit with medium land resources and for landless labors. In addition, goats are important for survival needs as they can provide plentiful habitual supply of milk, meat, fibre and skin. Day by day the goat is being a significant food source, because of its ability to convert poor quality feed in to valuable human food as well as other resources. Gujarat has about 46.40 lakhs of goats. Gujarat has about 46.40 lakhs of goats and this goat population is 130 % more than the sheep population in the state (Anonymous, 2008) and these figures indicate an important of goat farming in Gujarat. The goat diversity in Gujarat is reflected in the form of five distinct goat breeds namely Mehsana, Surti, Kutchi, Gohilwadi, Zalawadi. Mehsana goat is dual purpose breed of Arid and semi arid climate of North Gujarat. The overall competence of goat farming is on the basis of body weight traits, production performance and reproductive performance and these traits are also important traits for genetic improvement. Unlike other livestock species, there is little information available on growth and milk production performance of goat breeds in the state. Therefore, present investigation was planned to study the growth, production and reproduction traits of Mehsana goat maintained at Sheep and Goat Research Station, Sardarkrushinagar Dantiwada Agricultural University, Sardarkrushinagar.

Materials and Methods

The data were collected over a period of four years (2007 through 2010) of Mehsana goat maintained at Sheep and Goat Research Station (SGRS), S. D. Agricultural University, Sardarkrushinagar. The growth performance of 381 Mehsana kids born during the years 2007 to 2010 and production and reproduction performance traits in does were collected and analyzed for the present study. The data on growth traits (kg) were grouped according to sex of kids and type of birth on body weight at birth (BW), 3 months (WW), 6 months (6MW), 9 month (9MW), 12 month (YW), daily weight gain (gm) from birth to weaning (ADG-I) and weaning to six months (ADG-II). The production and reproduction performance traits studied were total lactation milk yield, fat %, SNF %, protein %, peak yield, days to attain peak yield, lactation length, dry period, weight at first mating, age at first service, service period, weight at first kidding, gestation period, age at first kidding, weight at kidding and kidding interval.

Results and Discussion

The means with their standard errors for growth as well as production and reproduction performance traits are presented in tables 1, 2 and 3, respectively.

Body Weight: The overall mean for BW was observed to be 2.81 ± 0.03 kg. The mean birth weight was significantly higher in male kids as compared to female kids (Table 1). The reports of Tomar *et. al.* (1997) Tomar & Kumar (2004) for birth weight in Sirohi and Kutchi kids fairly agreed with present findings, but Singh (2003) reported higher values in Marwadi kids (3.00 ± 0.21 kg). The subsequent body weights, viz., WW, 6MW and YW were also significantly higher in male kids as compared to female kids.

Daily Weight Gain: The overall means for ADG-I and ADG-II were observed to be 76.91 ± 1.12 and 40.05 ± 1.35 gm, respectively. Present findings on daily weight gains are contrary to the results reported by Tomar & Kumar (2004) who found comparatively higher estimates for ADG-I (87.52 ± 3.16 gm.) and ADG-II (51.35 ± 3.01 gm.) in Sirohi kids. The type of birth revealed better growth in kids born as single up to weaning as compared to kids born as twins (80.00 ± 1.44 Vs. 67.67 ± 2.58 kg.) but in twin kids weight gain was slightly higher during post weaning period as compared to kids born as single (42.96 ± 2.90 Vs. 38.89 ± 1.52 kg). The comparison of weight gains in male and female kids revealed that males attained better growth at both the pre-weaning as well as the post-weaning periods than female kids (Table 2).

Table 1: Body weight (kg) at different age groups in Mehsana Goat

Sr. No.	Age group	Sex	Mean \pm SE
1	Birth	Male	2.95 \pm 0.02 ^a (205)
		Female	2.66 \pm 0.03 ^b (176)
		Overall	2.81 \pm 0.02 (381)
2	3 months	Male	10.25 \pm 0.15 ^a (236)
		Female	9.61 \pm 0.14 ^b (215)
		Overall	9.92 \pm 0.11 (451)
3	6 months	Male	13.51 \pm 0.23 ^a (149)
		Female	12.82 \pm 0.20 ^b (138)
		Overall	13.24 \pm 0.16 (287)
4	9 months	Male	14.88 \pm 0.33 (131)
		Female	14.67 \pm 0.29 (132)
		Overall	15.70 \pm 0.21 (263)
5	12 months	Male	20.49 \pm 0.33 ^a (108)
		Female	18.13 \pm 0.30 ^b (123)
		Overall	19.23 \pm 0.24 (231)

Mean with diverse superscripts within particular age group differ significantly (P<0.05)

Table 2: Pre-weaning (ADG-I) and post-weaning (ADG-II) daily weight gain (gm) in Mehsana kids

Category		Mean \pm SE	
		ADG – I	ADG – II
Sex of Kids	Male	78.45 \pm 1.87 ^a (167)	42.04 \pm 2.21 ^a (137)
	Female	75.13 \pm 1.65 ^b (146)	37.70 \pm 1.69 ^b (119)
Type of Birth	Single	80.00 \pm 1.44 ^a (233)	38.89 \pm 1.52 ^a (183)
	Twins	67.67 \pm 2.58 ^b (80)	42.96 \pm 2.90 ^b (73)
Overall		76.91 \pm 1.12 (313)	40.05 \pm 1.35 (256)

Mean with diverse superscripts within particular category differ significantly (P<0.05)

Production and Reproduction Performance Traits: The means along with standard errors for production traits are presented in Table 3. The overall mean lactation milk yield was observed to be 70.23 \pm 1.37 kg. Present findings fairly agree with the report of Mishra *et al.* (1983) in Sirohi goats (72.20 kg.). Arun Kumar *et al.* (2004), however, reported higher lactation milk yield in Kutchi goat (112.56 \pm 5.65 kg.). The average lactation length in Mehsana goat in the present study was 224.00 \pm 4.19 days (Table 3) which is in corroboration with the findings of Arun Kumar *et al.* (2004) in Kutchi goat. The milk fat, SNF and Protein contents in Mehsana goat were found to be 3.17 \pm 0.02 %, 8.32 \pm 0.01 % and 3.13 \pm 0.01 %, respectively. The overall interval between kidding to next conception averaged 209.66 \pm 2.90 days indicating that

maximum goats conceived within seven months after kidding. The present findings on service period in Mehsana goats are higher than those reported by Mishra (1985) in Beetal goats (178 ± 5.7 days). Present study revealed the overall dry period to be 112.31 ± 6.64 days in Mehsana goat. The overall mean for kidding interval was found to be 364.40 ± 4.32 days. The lower estimates for kidding interval were reported by Mukundan (1979) in Malabari goat (307 to 332 days) and Mishra (1985) in Beetal goat (304 ± 4.1 days). However, higher estimates have been reported by Arun Kumar *et. al.* (2006) in Kutchi goats (411.17 ± 50.95 days) as compared to our findings in Mehsana goat.

Table 3: Production and Reproduction performance of Mehsana does

Sr. No.	Traits	Mean \pm SE
1	Total lactation yield (lit)	70.23 ± 1.37 (248)
2	Peak yield (lit)	0.580 ± 0.01 (231)
3	Days to attain peak yield	156.23 ± 3.72 (198)
4	Lactation length (days)	224.00 ± 4.19 (274)
5	Service period (days)	209.66 ± 2.90 (216)
6	Dry period (days)	112.31 ± 6.64 (195)
7	Kidding Interval (days)	364.40 ± 4.32 (216)
8	Weight at kidding (kg)	31.58 ± 0.29 (319)
9	Weight of first kidding (kg)	28.19 ± 0.45 (70)
10	Age at first kidding (days)	716.52 ± 19.01 (48)
11	Gestation period (days)	148.97 ± 0.28 (234)
12	Age at first service (days)	560.43 ± 20.83 (49)
13	Weight at first mating (kg)	26.00 ± 0.50 (49)
14	Fat %	3.17 ± 0.02 (2798)
15	SNF %	8.32 ± 0.01 (2798)
16	Protein %	3.13 ± 0.01 (2798)

The weight and age at first kidding depends on the onset of puberty and indicates the reproductive potential of does. The overall means for weight and age at first mating in the present study were found to be 26.00 ± 0.50 kg and 560.43 ± 20.83 days, whereas the corresponding values for these traits at first kidding were 28.19 kg and 716.52 ± 19.01 days, respectively. Present findings for weight at first kidding fairly agreed with report of Mishra *et. al.* (1983) in Sirohi goat. Mukundan (1979) reported the age at first kidding in Malabari goat varying from 455 to 612 days. Arun Kumar *et. al.* (2006), however, reported age at first kidding of 698.41 ± 1.49 days in Kutchi goats. The mean gestation period in the present study was observed to be 148.97 ± 0.28 days. Similar results were reported by Arun Kumar *et. al.* (2004) and Mishra *et. al.* (1979) in Kutchi and Sirohi goat breeds.

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