

FACTORS INFLUENCING MILK PRODUCTION OF LOCAL GOATS OF ROHILKHAND REGION OF UTTAR PRADESH UNDER SEMI INTENSIVE SYSTEM*

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(Received : 04.06.2013, Accepted: 10.09.2013)

ABSTRACT

An investigation was undertaken to study the effect of season, parity, type of birth and teat abnormality on milk yield of local goats of Rohilkhand region. A total of 32 does were selected for the experiment, and were grouped according to season (rainy and winter), parity (primiparous and multiparous), type of birth (single and twin), and type of teat abnormality (normal teat and abnormal teat). All does were milked twice daily and milk yield was recorded up to 90 days. It was found that average daily milk yield (ADMY) and total milk yield of 90 days (TMY) were significantly ($P < 0.01$) higher in rainy season (0.726 ± 0.05 L ; 65.32 ± 8.81 L) than winter season (0.657 ± 0.02 L ; 57.91 ± 3.51 L). Regarding parity, ADMY and TMY were significantly higher ($P < 0.01$) in multiparous does (0.754 ± 0.02 L and 66.76 ± 3.97 L) than primiparous does (0.515 ± 0.03 L and 45.73 ± 3.18 L). Average TMY for single kidded and twin kidded does were 51.37 ± 4.05 L and 65.89 ± 4.53 L, respectively and it didn't differ significantly. Presence of supernumerary teat (16%) was the prominent form of abnormality observed followed by bifurcal teats (4%) and asymmetrical udder (4%). Average milk production in does with teat abnormality was non-significantly lower than the normal animals. It can be concluded that milk production vary significantly with the season and parity in these local goats.

Key words : Goat milk, Parity, Season, Teat abnormality.

Local goat of Rohilkhand is a non-descript goat found in Rohilkhand region of Western Uttar Pradesh, which falls in Upper Gangetic Plain Region of India. This region has a population of 12, 97,850 goats out of total population of 14.79 millions goats in whole Uttar Pradesh¹. Except small fraction of descript breeds (like Jamunapari and Barbari) majority are of nondescript (51.38%) and other graded (25.08%) types. In an attempt

to document and characterize these goats an institutionally funded project is functioning at IVRI and a flock of nearly 225 animals is being maintained at the Institutional goat farm. Goat contributes 3.4 percent (3.9 MT) of the India's total milk production². However, many factors *viz.* breed, parity, stage of lactation, frequency of milking, age of doe, season of kidding and plane of nutrition are known to influence and determine milk production in dairy goats^{7,15}. Therefore, the present study was undertaken to determine the effect of various influencing factors (*viz.* season of birth, parity, type of birth and type of teat abnormality) on milk production of local goats of Rohilkhand region.

* Part of M.V.Sc thesis submitted by first author

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Table 1: Average daily milk yield and Total Milk yield (L) of local goats of Rohilkhand

	I month (LSM±SE)	II month (LSM±SE)	III month (LSM±SE)	Overall (LSM±SE)
Season				
Winter (n=25) (July- Sept)	0.693±0.03 (20.44±1.12)	0.640±0.04 (18.75±1.37)	0.638±0.03 (18.72±1.15)	0.657 ^a ±0.02 (57.91 ^a ±3.51)
Rainy (n=7) (Nov- Jan)	0.752±0.10 (22.55±3.21)	0.725±0.10 (21.74±3.10)	0.701±0.08 (21.02±2.56)	0.726 ^b ±0.05 (65.32 ^b ±8.81)
Parity				
Primiparous(n=11)	0.567±0.03 (16.78±1.04)	0.477±0.04 (14.12±1.41)	0.502±0.03 (14.83±0.98)	0.515 ^a ±0.03 (45.73 ^a ±3.18)
Multiparous (n=21)	0.779±0.04 (23.06±1.39)	0.754±0.04 (22.17±1.46)	0.731±0.04 (21.53±1.26)	0.754 ^b ±0.02 (66.76 ^b ±3.97)
Type of birth				
Single (n=14)	0.614±0.03 (18.23±1.14)	0.549±0.05 (16.31±1.72)	0.568±0.04 (16.82±1.36)	0.576 ^a ±0.03 (51.37±4.05)
Twin (n=18)	0.777±0.05 (22.98±1.61)	0.744±0.05 (21.81±1.62)	0.718±0.04 (21.09±1.42)	0.746 ^b ±0.02 (65.89±4.53)
Type of teats				
Normal (n=19)	0.733±0.04 (21.63±1.37)	0.668±0.04 (19.58±1.37)	0.668±0.04 (19.59±1.37)	0.690±0.02 (60.80 ±4.14)
Abnormal (n=6)	0.567±0.08 (16.66±2.43)	0.55±0.08 (16.13±2.43)	0.543±0.08 (15.96±2.43)	0.553±0.04 (48.75 ± 5.37)

Means having different superscript (a,b) in a column differ significantly (P<0.01)
Values in the parenthesis represent the Total Milk yield (L) of respective periods.

Factor influencing milk production in goats

MATERIALS AND METHODS

The present study was conducted in Sheep and Goat unit, Livestock Production and Management section, Indian Veterinary Research Institute, Bareilly, Uttar Pradesh, India. The female goats (does) were selected from the flock of 225 goats which are being reared in the institutional farm to document and characterize the local goat of Rohilkhand region. All the animals were maintained under stall-fed condition and housed in a separate shed attached with open paddock, which allowed the animals to loiter freely. Cultivated green fodder (maize/berseem/oat) and water was always available to the experimental animals *ad libitum* during the course of study. Extra concentrate mixture was provided @ 300 gm/head/day.

A total of 32 does were used to study the effect of different factors on milk yield. To determine effect of season does were divided into two groups according to season of kidding *i.e.* rainy (July- September) and winter (November-January). To determine effect of parity does were grouped into two as primiparous and multiparous. To determine effect of type of birth does were grouped into two as single kidded and twin kidded. Effect of any kind of abnormal type of teat *i.e.* supernumerary or bifurcal was also taken into consideration. Does were hand milked twice daily and milk yield was recorded upto 90 days for each animal. The information collected by data sheet was pooled and analyzed as per standard statistical procedure¹⁶ using SAS 9.2.

RESULTS AND DISCUSSION

The effect of season on milk yield has been represented in table 1. There was a decreasing trend in average daily milk yield (ADMY) in both the seasons from first month to third month. However, overall ADMY in rainy season (0.726 ± 0.05 L) was found significantly ($P < 0.01$) higher than

winter season (0.657 ± 0.02 L). Total milk yield (TMY) of rainy season (65.32 ± 8.81 L) was also found significantly ($P < 0.01$) higher than winter season (57.91 ± 3.51 L). This trend of total milk yield was observed in each month. The higher milk production in rainy season compared to winter season might be contributed by the availability of good fodder and comfortable weather condition to the animals. Earlier researcher⁶ also concluded that season of kidding significantly influenced total milk yield and daily milk yield in goats. Jamunapari goat breed which are found in the adjacent region of Rohilkhand, also found to produce highest milk yield in winter (December to February) followed by autumn (September to November) kidder¹¹. The TMY of winter kidder and autumn kidder were found higher by 17.2 and 3.63 percent, respectively as compared to those, which kidded in summer¹⁵.

The variation in milk yield due to parity has been represented in table 1. The overall ADMY was found significantly higher ($P < 0.01$) for multiparous does (0.754 ± 0.02 L) in comparison to primiparous does (0.515 ± 0.03 L). The similar trend was also observed for TMY. For multiparous does TMY (66.76 ± 3.97) was significantly higher compared to primiparous does (45.73 ± 3.18). Earlier reports⁶ conclude that milk yield increases steadily with the parity; it shows an almost steady growing trend from first to fifth lactation. Lactation records obtained from different breeds and countries show that goats usually reach maximum milk yield at third or, less frequently, at fourth lactation¹³. It was also observed that milk production generally peaks at a parity of 3 or 4, thereafter declining slowly⁹.

The effect of type of birth on milk yield has been represented in table 1. The similar trend as for season and parity was also observed for type of birth. The average value of TMY for single kidded does was 51.37 ± 4.05 L and for twin kidded does was 65.89 ± 4.53 L. However, mean values

were not found statistically significant ($P>0.05$) for type of birth. In agreement with our study earlier findings¹⁰ also stated that does with twins produced more milk than those with a single kid but this difference is non-significant. Few workers^{12, 15} also concluded that there was no significant effect of type of kidding on milk production trait. However, in contrast to our study many other studies suggest that there is a positive relationship between litter size and milk production in sheep and goats^{4,6,15}. It was also reported that mammary growth during gestation is affected by the number of kids, and this has a subsequent effect on milk production which is independent of age, body mass and season. Sirohi goat with multiple birth yielded more milk daily compared to single birth¹⁵. Milk yield of goats, both dairy^{5,8} and other breeds¹⁷ could be affected by prolificacy. It is worth considering that, even if kids were not allowed to suckle, milk yield was affected by prolificacy⁶.

Presence of supernumerary teat (16%) was the prominent form of abnormality observed followed by bifurcal teats (4%) and asymmetrical udder (4%). Table 1 represents average milk production in animal with normal and abnormal udder structure. The ADMY recorded in animals with abnormal teats was 0.548 ± 0.06 L while animal without abnormality produced 0.674 ± 0.04 L. Results indicate that the average milk production in animal with teat abnormality was slightly lower than the normal animals, but these value did not differ significantly ($P>0.05$). Since milk production of does having teat defect is at par with normal teats it can be concluded that defect teats does not affect the milk yield. Researcher¹⁴ also observed that supernumerary teats did not affect milk yield of the animal nor prevented kids from suckling. Earlier worker³ reported that does with symmetrical udder had higher estimates for udder attachment and produced more milk than does with asymmetrical udder.

CONCLUSION

It can be concluded that milk production vary significantly with the season and parity while influence of number of kids per doe and abnormal

teats found to be non significant in the local goats of Rohilkhand of Uttar Pradesh.

ACKNOWLEDGMENT

Authors are highly thankful to Director, IVRI for providing all the facilities to carryout this

research work at Sheep and Goat Farm.

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