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Effect of different levels of concentrate mixture feeding on milk yield, post partum Estrus and lactation length in Sirohi Goats

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Abstract

Twenty four lactating Sirohi goats averaged 36.2 ± 0.70 kg body weight were used in a comparative feeding trial to investigate the effect of different levels of concentrate mixture feeding on milk yield, post partum estrus and lactation length in Sirohi goats during November, 2016 to May, 2017. The total duration of feeding experiment was 90 days, however, daily milk yield was measured at 15 days intervals beginning on post-partum day 15 (i.e., on days 15, 30, 45, 60, 75, and 90) by hand milking and lactation length was also recorded to see the total lactation period in Sirohi goat. Post partum estrus was detected by visual observation. The animals were divided randomly into four equal ($n=6$) groups. Apart from daily grazing, concentrate mixture feeding were given to Sirohi goats in ratio of @ 0.00 gm (T_1), 100gm (T_2), 200gm (T_3) and 300gm (T_4) respectively with *Prosopis cineraria* dry leaves (Khejri) ad libitum. The results revealed that the Sirohi goats showed significantly ($P<0.05$) higher daily milk yield in T_4 followed by T_3 , T_2 than control T_1 . Total milk yield in Sirohi goats showed significantly ($P<0.05$) higher percent 57.24%, 36.05% and 18.58% compared to control T_1 respectively.

The mean duration of the post partum estrus period in Sirohi goats was recorded as 88.18 ± 2.26 days under semi-intensive management condition and the acceptable post partum estrus ranges between 80 to 100 days. There was no significant difference in the post partum estrus interval in Sirohi does after giving the different levels of concentrate mixture feeding. The mean lactation length was recorded as 153.5 ± 1.70 days during current study in Sirohi goats and the lactation length ranges between 141 to 160 days.

Keywords: Concentrate mixture, Milk yield, Post partum estrus, Lactating length, Sirohi Goats.

Introduction

Goats are the backbone of the economy of small and marginal farmers and landless labours in India. It is an insurance against crop failure and provides alternate sources of livelihood of farmers round the year. Goat is a poor Man's cow because of their immense contribution to the poor people economy. It is regular source of additional income for poor and landless or marginal farmers being small sized animal the goat can easily be managed by women and children (Prasad, 2010) [10]. In general concentrate are feeds that are high in nitrogen-free-extract and TDN and low in crude fiber. Feeding strategies that include grazing and concentrate supplementation improve the milk fat, protein, lactose and total solids compared to grazing or forage alone (Soryal *et al.* 2004) [17]. Incorporation of concentrates in goat diets is intended to increase dietary energy, protein, mineral and vitamins and optimize the efficiency of feed utilization for growth, gestation or milk production (Morand-Fehr and Sauvant 1987) [8]. Nutrition affects both the yield and composition of the milk produced (Bencini and Pulina 1997) [2].

Materials and methods

In present study, 24 lactating Sirohi goats were randomly allocated into four equal ($n=6$) groups. The concentrate mixture was fed to goats individually as per requirement of experiment. There was 18-20% crude protein (minimum), 12% crude fiber (maximum), 2% salt and 2400 Kcal. (ME) / Kg in concentrate mixture that was taken for present study. All goats were managed semi-intensively under of standard management practices. Goats were also allowed feeding leaves of *Prosopis cineraria* (Khejri) ad libitum and concentrate mixture was fed to goats individually as per requirement of experiment. Animals were allowed access to fresh drinking water ad libitum in the barns. The feeding practice was remained uniform throughout the study period. For individual doe, daily milk yield was measured at 15 days intervals beginning on post-partum day 15 (i.e., on days 15, 30, 45, 60, 75, and 90) by hand milking.

Post partum estrus period was calculated as the interval from the day of kidding to the day of first expression of symptoms of estrus (postpartum estrus) and expressed in days. Estrus detection was being carried out by making one of the bucks as teaser which was used twice a day (morning and evening) for identifying does in estrus. Teaser buck was used after one month of kidding. White paint was used on dorsal side of teaser buck to identify doe that was coming into estrus. Lactation length is the period in which the doe is in milk. Lactation period is the breed's property. Lactation length was calculated from 15 days after kidding until daily milk yield dropped to below 0.20 lit. Lactation length data was recorded of each doe on separate proforma specially designed for this purpose.

Data related to daily milk yield, post partum estrus and lactation length were statistically analyzed using the one-way analysis of variance (SAS system 'Local', W32-7PRO) for completely randomized design. All statement of significant differences was based on the 0.05 probability level. Significant differences among treatment, within the experiment, were analyzed using Duncan's multiple rang test.

Results and discussion

Data of daily milk yield (DMY) and total milk yield (TMY) during lactation periods are presented in Table (1). The total milk yield (TMY) which was taken upto 90 days of lactation in Sirohi goats showed the same trend as the highest value with T₄ (25.38 litres) followed by T₃ (21.96 litres) than T₂ (19.14 litres) compared with control T₁ (16.14 litres). The present result indicated that T₄, T₃ and T₂ increased TMY ($P<0.05$) by 57.24%, 36.05% and 18.58%, respectively, compared with control T₁. Over 90 days, the DMY and TMY significantly showed the highest estimates with T₄ followed T₃ than T₂ and than T₁ control. The results of this study were similar to those reported by Rohilla and Khem Chand (2004)

who studied on twenty four Marwari lactating does and milk yield was higher in the supplemented groups compared to the grazing group. Average daily milk yield was 36% and 29% higher in T₂ and T₃ respectively compared to T₁ (control). Basitan and Jarcia (2013) [1] carried out a study on Anglo Nubian goats to see the effect of supplementing Napier grass and Malunggay diet on milk yield. They found highest milk yield in T₃ (458.33 ml) followed by T₂ (431.33 ml) and T₁ (246.80 ml) control. They found significant effect of supplementing Napier grass and Malunggay diet on milk yield of Anglo Nubian dairy goats. Saba *et al.* (2016) [15] reported that the effect of partial substitution of protein in the ration by corn steep liquor (CSL) on milk production of Zaraibi goats. Total milk yield was significantly increased by 13.0, 21.0 and 37.8%, respectively for T₂, T₃ and T₄ than control T₁ diet. They also found significantly increased in daily milk yield with T₂ (1.13 Kg/h), T₃ (1.21 kg/h) and T₄ (1.38 Kg/h) than control T₁ diet. The present results were found corroborated with Basitan and Jarcia (2013) [1] and Saba *et al.* (2016) [15].

Table 1: Effect of concentrate mixture feeding on average daily milk yield (DMY) and total milk yield (TMY) of goats during the lactation period

DMY (lit.)	Treatments				SEM±	P value
	T ₁	T ₂	T ₃	T ₄		
15 days	0.33 ^b	0.38 ^b	0.41 ^b	0.55 ^a	0.0473	0.001
30 days	0.33 ^b	0.40 ^b	0.52 ^a	0.60 ^a	0.055	0.0005
45 days	0.45 ^b	0.52 ^b	0.55 ^{ab}	0.63 ^a	0.0468	0.0075
60 days	0.48 ^c	0.57 ^{bc}	0.65 ^{ab}	0.73 ^a	0.043	<0.0001
75 days	0.53 ^c	0.62 ^c	0.75 ^b	0.85 ^a	0.0431	<0.0001
90 days	0.57 ^d	0.70 ^c	0.78 ^b	0.87 ^a	0.0398	<0.0001
TMY (lit.)	16.14 ^d	19.14 ^c	21.96 ^b	25.38 ^a	-	-

a, b, c and d means with the same letters in the same row are not significantly different ($P<0.05$).

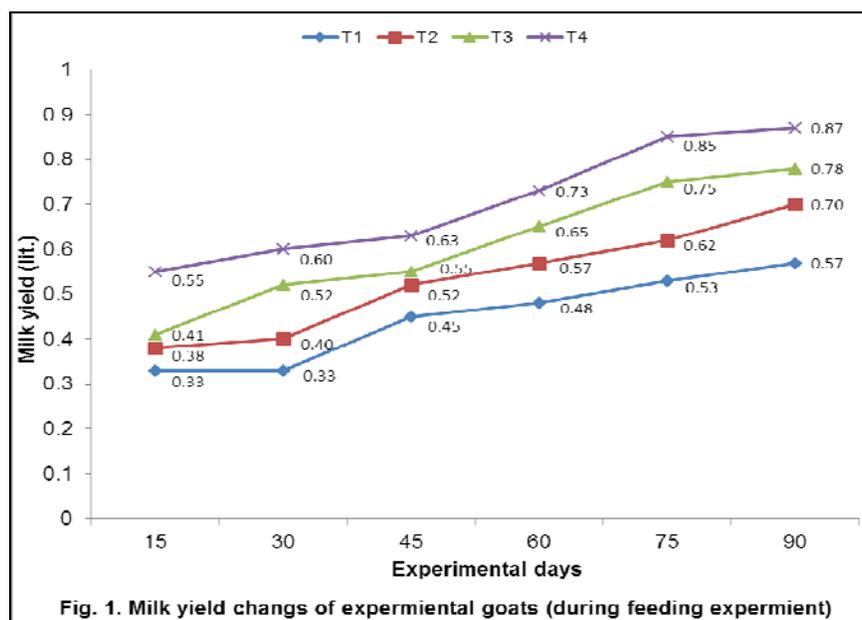


Fig. 1. Milk yield changes of experimental goats (during feeding experiment)

The mean duration of the post partum estrus period in Sirohi goats was recorded as 88.18 ± 2.26 days under semi-intensive management condition and the acceptable post partum estrus ranges between 80 to 100 days Table (2). The results of present investigations are in close agreement to those reported by Islam *et al.* (2009) [4] who carried out a study in Black Bengal goats. However, Das *et al.* (2004) [3] reported higher

values of average service period of 137.92 ± 1.16 days in Assam local goats. Whereas as Rao and Pattanayak (2007) [13] who reported lesser values of average service period 62.27 ± 0.14 days in Keonjhar goat breed of Orissa and 68.21 ± 0.46 days in Kamohri breed of goat Kunbhar *et al.* (2016) [6]. Whereas, higher values of average service period in Sirohi goats were reported by Pathodiya *et al.* (2008) [9] who

found that there was no significant difference in the post partum estrus interval for does giving birth to different number of offspring. Management is one of the important factors that affect period of post partum estrus in lactating animals. Poor management of goats after kidding may lead to higher period of post partum in goats.

Table 2: Post partum estrus and lactation length in Sirohi goat managed under semi-intensive management conditions

S. No.	Trait	Mean (SEM±)	Range	No. of animals
1.	Post partum estrus (days)	88.18±2.26	80-100	11
2.	Lactation length (days)	153.5±1.70	141-160	24

The mean lactation length in present investigation was recorded as 153.5±1.70 days in Sirohi goats and the lactation length ranges between 141 to 160 days Table (2). The lactation length in Sirohi goat was found of 153.5±1.70 (141-160) that was similar in all groups. The results of present investigations are in close agreement to those reported by Rai and Singh (2005) who that carried out a study on production performance of Jakhrana goats that was evaluated under semi-intensive and extensive system of management in its home tract. They found the average lactation length was 143.0±3.2 days in semi intensive system and 118.0±2.3 days in extensive system of management. Similar results were reported by Prakash *et al.* (2009) [11] who carried out a study on 30 does that were randomly divided into three group *viz.* stall feeding, semi-intensive and extensive system does of Barbari breed. They found significantly ($P<0.01$) higher length of lactation when goat was stall fed (150.2±3.83 days) than extensive system (92.5±1.12 days). Verma *et al.* (2009) [18] also reported similar results in Pantja breed of goat that was identified in the Himalayan basin (156.0±2.5 days). Similar results were also reported by Singh *et al.* (2014) [16] in Jamunapari breed of goat. However, higher lactation length was reported in Jakhrana breed of goat (183.04±4.04days) by Mandal *et al.* (2010) [7] and in Kutchi breed of goat (202.5±5.65 days) by Kumar *et al.* (2004) [5] respectively. This could be due to variation in breed or variation in nutrition provided to lactating does. Nutrition is one of the most important factors that directly influence the lactation period in goats.

Conclusion

On the basis of the present investigation, it may be concluded that the daily milk yield in Sirohi goats was found higher in T₄ followed by T₃, T₂ and control T₁ respectively. Higher daily milk yield was obtained with increasing amount of concentrate mixture feeding in Sirohi goats in comparison to control. Similarly, the total milk yield in Sirohi goats was also found higher with increasing amount of concentrate mixture feeding in comparison to control T₁. However, the effect of different levels of concentrate mixture feeding in Sirohi goats on post partum estrus and lactation length was found non-significant.

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