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Dr. Jitendra Chopdar
Department of Livestock
Production and Management,
CVAS, Navania, Vallabh Nagar,
Udaipur, Rajasthan, India

Dr. MC Sharma
Department of Livestock
Production and Management,
College of Veterinary and
Animal Science, Navania,
Vallabh Nagar, Udaipur,
Rajasthan, India

Dr. MS Meel
Department of Animal
Nutrition, College of
Veterinary and Animal
Science, Navania,
Vallabh Nagar, Udaipur,
Rajasthan, India

Dr. HM Alam
Department of Veterinary
Parasitology, College of
Veterinary and Animal
Science, Navania,
Vallabh Nagar, Udaipur,
Rajasthan, India

Corresponding Author:
Dr. MS Meel
Department of Animal
Nutrition, College of
Veterinary and Animal
Science, Navania,
Vallabh Nagar, Udaipur,
Rajasthan, India

Effect of different feeding management system on drinking, urinating and sleeping behaviour of Sirohi goat kids

Jitendra Chopdar, MC Sharma, MS Meel and HM Alam

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Abstract

The present study was conducted to evaluate the effect of different feeding management systems on drinking, urinating and sleeping behaviour of Sirohi goat kids. The experiment was carried out at Livestock Research Station, Bojunda, Chittorgarh (Rajasthan) for a period of 90 days. A total of 21 Sirohi goat kids (6 months age) were randomly divided into three groups: extensive (T₁), semi-intensive (T₂) and intensive (T₃), with 7 animals in each group. Behavioural observations were recorded weekly for 24 hours. The results revealed that the average drinking time (min/day) was significantly ($p < 0.01$) higher in T₁ (6.92) and T₂ (6.89) compared to T₃ (5.94). Increased drinking behaviour in grazing groups was attributed to higher physical activity and exposure to environmental stress. Urinating behaviour showed non-significant differences among treatments, with pooled mean values of 3.01, 3.01 and 3.04 min/day in T₁, T₂ and T₃ groups, respectively, indicating that feeding system had minimal influence on urination patterns. Sleeping behaviour differed significantly ($p < 0.01$) among groups, with maximum time observed in T₃ (496.19 min/day), followed by T₁ (378.24) and T₂ (375.96). The increased sleeping time in intensive system suggests reduced locomotor activity and a more comfortable, stress-free environment. Overall, the study indicates that feeding management systems significantly influence behavioural patterns of Sirohi goat kids. Extensive and semi-intensive systems promote higher drinking activity, while intensive system enhances resting behaviour. Urination behaviour remains relatively unaffected across systems.

Keywords: Sirohi goat kids, feeding system, drinking behaviour, urination, sleeping behaviour

Introduction

Goat farming plays a crucial role in the livelihood of rural populations, particularly in developing countries like India. Among indigenous breeds, Sirohi goats are well adapted to arid and semi-arid regions and are valued for their meat production and adaptability. Feeding management systems such as extensive, semi-intensive and intensive systems significantly influence productivity and behaviour of goats. Animal behaviour is an important indicator of welfare, physiological status and adaptation to environmental conditions. Behavioural parameters such as drinking, urination and sleeping provide insight into the health, comfort and metabolic activity of animals. Understanding these behaviours helps in optimizing management practices for better productivity and welfare. Feeding systems affect activity patterns due to differences in movement, feed intake and environmental exposure. Goats under extensive systems spend more time grazing and walking, which may increase water intake and alter behavioural responses. In contrast, intensive systems reduce movement and may increase resting and sleeping time. Previous studies have reported that feeding management influences behavioural patterns in goats. Yurtman *et al.* (2005) ^[7] observed that concentrate feeding had little effect on urination behaviour, whereas Pathan *et al.* (2017) ^[4] reported higher drinking activity in grazing systems. Adiwiniarti *et al.* (2019) ^[1] indicated that diet composition affects drinking behaviour in goats. Ramchandran *et al.* (2018) ^[5] demonstrated that drinking behaviour varies with feeding and environmental conditions, while Keskin *et al.* (2005) ^[2] highlighted the role of feeding system on resting behaviour. However, limited information is available on behavioural responses of Sirohi goat kids under different feeding systems. Therefore, the present study was undertaken to evaluate the effect

of feeding management systems on drinking, urinating and sleeping behaviour of Sirohi goat kids.

Materials and Methods

Experimental Location and Animals

The study was conducted at Livestock Research Station, Bojunda, Chittorgarh, Rajasthan. A total of 21 Sirohi goat kids (6 months age) were selected and randomly divided into three groups (T₁, T₂, T₃) with 7 animals each.

Experimental Design

- **T₁ (Extensive):** Grazing for 8 hours/day without supplementation
- **T₂ (Semi-intensive):** Grazing + concentrate supplementation
- **T₃ (Intensive):** Stall feeding with concentrate and fodder

The experiment lasted for 90 days including a 15-day adaptation period.

Behavioural Observations

Behavioural parameters (drinking, urinating and sleeping) were recorded weekly for 24 hours using direct observation without disturbing animals.

- Drinking time (min/day)
- Urination time (min/day)
- Sleeping time (min/day)

Statistical Analysis

Data were analyzed using factorial design as per Snedecor and Cochran (1994) [6] and mean differences were tested using Duncan's Multiple Range Test.

Results

The data presented in Table 1 indicate that feeding management systems significantly influenced the drinking and sleeping behaviour of Sirohi goat kids, while urination behaviour remained unaffected. The average drinking time was significantly ($p < 0.01$) higher in T₁ (6.92 min/day) and T₂ (6.89 min/day) groups compared to T₃ (5.94 min/day), suggesting that goats under extensive and semi-intensive systems consumed more water, likely due to increased physical activity and grazing exposure.

Table 1: Average drinking, urination and sleeping time of Sirohi goat kids under different feeding management systems (min/ day)

Parameters	Groups			SEM
	T ₁	T ₂	T ₃	
Drinking time	6.92 ^b	6.89 ^b	5.94 ^a	0.033**
Urination time	3.01	3.01	3.04	0.021 ^{NS}
Sleeping time	378.24 ^a	375.96 ^a	496.19 ^b	2.53**

Means with different superscripts in a row differ significantly.

NS = Non-significant ($P > 0.05$)

** Significant at 1 per cent probability ($p < 0.01$)

In contrast, urination time did not differ significantly ($P > 0.05$) among the groups, with values ranging narrowly from 3.01 to 3.04 min/day, indicating that feeding systems had minimal impact on this parameter. Sleeping time showed a highly significant ($p < 0.01$) difference, with the T₃ group (496.19 min/day) exhibiting considerably higher values than T₁ (378.24 min/day) and T₂ (375.96 min/day), which were statistically similar. This suggests that goats in

intensive systems experience more rest due to reduced movement and a controlled environment.

Discussion

Higher drinking time in extensive and semi-intensive systems may be attributed to increased locomotor activity and exposure to environmental stress during grazing. Similar findings were reported by Pathan *et al.* (2017) [4] and Yurtman *et al.* (2005) [7], who observed increased water intake in grazing animals. The non-significant effect on urination behaviour indicates that physiological water balance remains stable across feeding systems. This agrees with Yurtman *et al.* (2005) [7], who reported no effect of feeding system on urination frequency. Significantly higher sleeping time in intensive system suggests reduced energy expenditure and improved comfort due to confinement. Similar observations were reported by Khound *et al.* (1996) [3] and Keskin *et al.* (2005) [2], indicating that stall-fed animals spend more time resting. Overall, behavioural differences reflect adaptation of animals to feeding systems, where grazing promotes activity while confinement enhances rest.

Conclusion

Feeding management systems significantly influence behavioural patterns of Sirohi goat kids. Extensive and semi-intensive systems increase drinking activity, while intensive system enhances sleeping behaviour. Urination behaviour remains unaffected. Intensive and semi-intensive systems are preferable for better welfare and management efficiency.

Conflicts of Interest

The authors declare that there are no conflicts of interest related to the publication of this article.

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