

Comparative Assessment Of Growth Performance And Body Conformation Of Non-Descript Goat Kids Under Semi-Intensive And Intensive Management Systems

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Abstract: The present study was conducted to investigate the growth performance and body conformation of non-descript goat kids under two management systems during 2016. The experiment was conducted at the Department of Livestock Management, Faculty of Animal Husbandry and Veterinary Sciences, Sindh Agriculture University, Tandojam. A total of eight (8) non-descript goat kids were divided into two groups, i.e., Group A (4 kids) and Group B (4 kids). Group A was maintained under a semi-intensive management system, in which the kids were allowed to graze and were provided with a concentrate mixture at the animal shed. Group B was reared under an intensive management system and was provided with chopped green fodder (berseem and maize) and concentrate at the animal shed. The experiment lasted for 12 weeks, during which data on body growth and conformation traits, including body length, height and girth, were recorded weekly. The collected data were statistically analyzed. The results showed that the average body weight of kids in Group A (14.56 kg) was significantly higher ($P < 0.05$) than that of kids in Group B (12.69 kg). Similarly, the average body conformation measurements, including body length, height and girth, were 49.51, 49.81 and 49.95 cm, respectively, in Group A, and were significantly higher than those recorded in Group B (47.87, 48.92 and 48.44 cm, respectively). Economic analysis further revealed that kids maintained under the semi-intensive management system were more economical, with a cost of Rs. 361 per kid compared with Rs. 214 per kid under the intensive management system. It was concluded that goat kids maintained under the semi-intensive management system (Group A) showed better performance in terms of body weight and conformation traits and were comparatively more economical.

Keywords: Non-descript goats; Semi-intensive management; Intensive management; Growth performance; Body conformation.

Introduction

The livestock sector is an important component of Pakistan's agriculture and contributes substantially to rural livelihoods and the national economy. Small ruminants, particularly sheep and goats, play a vital role in rural communities by providing meat, milk, fibre, skins and regular household income, especially in areas where crop cultivation and large-ruminant production are less suitable (Daskiran et al., 2006; Devendra, 2001). Their relatively low production cost, ability to utilize poor-quality forages and adaptability to diverse environments make sheep and goats an important source of livelihood for small and resource-limited farmers. Despite their importance, small-ruminant productivity in Pakistan remains constrained by traditional production practices, inadequate feeding management, limited availability of quality fodder and insufficient technical knowledge. Feeding practices directly influence feed intake, growth rate, production efficiency and the economic returns of livestock farming. Feed intake and growth performance are also affected by genetic differences and management conditions and may therefore be considered important criteria in animal selection (Cammack et al., 2005). Appropriate feeding and management can improve growth performance, carcass characteristics and meat quality, while concentrating supplementation has been reported to enhance daily weight gain, dressing percentage and carcass quality in young small ruminants (Warmington and Kirton, 1990; Kosum et al., 2003; Johnson et al., 2005; Kaleri et al., 2025; Kaleri et al., 2016). The productivity of goats is closely associated with the quality and availability of feed throughout the year. In Pakistan, fodder availability fluctuates with season, climatic conditions and soil characteristics, while the replacement of fodder-producing land with cash crops further contributes to feed shortages (Bruzon, 2007). Therefore, efficient feeding and management systems are necessary to improve the utilization of available resources and enhance animal productivity. Previous studies have demonstrated that suitable combinations of fodder and concentrate can improve the performance of growing small ruminants (Mahajan et al., 1976; Kochapakdee et al., 1994; Kaleri et al., 2017; Khan et al., 2025; Rind et al., 2018). Considering the importance of goats for rural livelihoods and the need to improve their productivity under practical farming conditions, the present study was designed to evaluate the growth performance and body conformation of non-descript goat kids maintained under semi-intensive and intensive management systems. The study aimed to determine the comparative effects of these management systems on body weight, body length, height and girth, as well as their relative economic efficiency.

Material and Methods

Experimental Animals and Management

The experiment was conducted during 2016 at the Livestock Experimental Station, Faculty of Animal Husbandry and Veterinary Sciences, Sindh Agriculture University, Tandojam, to evaluate the growth performance, body conformation and economic efficiency of non-descript goat kids under two management systems. Eight healthy, weaned non-descript goat kids (male and female), aged 2–3 months, were selected from the livestock unit after physical examination and a 10-day adaptation period. The animals were randomly divided into two equal groups, with four kids in each group.

Group A (semi-intensive management): Kids were allowed 7–8 h of daily grazing around the farm area and were provided with concentrate ration at the pen.

Group B (intensive management): Kids were maintained in pens without grazing and were provided chopped green fodder (maize and jantar), concentrate ration and fresh drinking water ad libitum.

The experimental period was three months. All animals were maintained under similar housing and routine management conditions except for the specified feeding and management practices.

Data Collection

Weekly body weight (kg) was recorded in the morning before feeding. Body conformation traits were measured using a standard measuring tape. Body height was measured from the withers to the ground, body length from the point of shoulder to the pin bone, and chest girth as the circumference of the chest immediately behind the elbow. Initial age was recorded after the adaptation period.

The concentrate ration was commercially prepared and contained wheat bran, maize gluten, rice polish, soybean molasses and trace elements. Feed and drinking water were provided according to the respective management systems.

Economic Analysis

Economic efficiency was assessed by considering major expenditure components, including animal purchase cost, feed, medication, labour and other miscellaneous expenses. The economic return was calculated by comparing total production costs with the sale value of the animals.

Experimental Design

Parameter	Group A	Group B
Management system	Semi-intensive	Intensive
Breed	Non-descript goat	Non-descript goat
Number of kids	4	4
Feeding system	Concentrate + grazing	Concentrate + green fodder
Grazing	7–8 h daily	No grazing
Green fodder	Grazing	Maize and Jantar
Water	Available	Ad libitum

Statistical Analysis

The recorded data on body weight and body conformation traits were tabulated and statistically analyzed using Statistics 8.1 computer software. Differences between the two management groups were evaluated using the appropriate statistical procedure, and significance was considered at $P < 0.05$.

Results

Initial Body Weight

The initial body weight of kids was comparable between the two management groups. Group A recorded a mean initial body weight of 8.78 kg, while Group B had 8.86 kg. Thus, both groups started the experiment with nearly similar body weights, providing a comparable basis for evaluating subsequent growth performance.

Table 2. Initial body weight (kg) of non-descript goat kids under two management systems

Group A	Weight (kg)	Group B	Weight (kg)
1A	8.95	5B	8.85
2A	8.75	6B	8.95
3A	8.85	7B	8.90
4A	8.55	8B	8.75
Mean	8.78	Mean	8.86

Weekly Body Weight

Body weight increased progressively in both groups throughout the 12-week experimental period. Group A showed consistently higher body weight, reaching 18.17 kg in week 12 compared with 16.03 kg in Group B. The mean body weight was 14.56 and 12.69 kg in Groups A and B, respectively, with a significant difference ($P < 0.05$).

Table 3. Weekly body weight (kg) of non-descript goat kids under two management systems

Week	Group A	Group B
1	9.36	9.12
2	10.34	9.65
3	10.95	9.99
4	11.66	10.47
5	12.38	10.76
6	13.02	11.27
7	13.71	11.66

Week	Group A	Group B
8	14.51	12.48
9	15.48	13.33
10	16.23	14.21
11	17.01	14.93
12	18.17	16.03
Mean	14.56	12.69
SE	0.2089	0.2168
LSD	0.4237	0.4396
P-value	0.001	0.001

Weekly Body Length

A gradual increase in body length was observed in both management systems during the experimental period. Group A recorded a higher mean body length of 49.51 cm compared with 47.87 cm in Group B. The difference between the two management systems was statistically significant ($P < 0.05$).

Table 4. Weekly body length (cm) of non-descript goat kids under two management systems

Week	Group A	Group B
1	45.55	45.50
2	46.40	45.97
3	47.11	46.33
4	47.90	46.73
5	48.68	47.12
6	49.43	47.50
7	50.05	47.91
8	51.01	48.46
9	51.46	48.88
10	51.80	49.21
11	52.43	50.06
12	52.74	50.78
Mean	49.51	47.87
SE	0.5515	0.2807
LSD	1.1184	0.5693
P-value	0.0001	0.0001

Weekly Body Height

Body height increased progressively in both groups over the 12-week period. Group A attained a higher mean body height of 49.81 cm, whereas Group B recorded 48.92 cm. The difference between management systems was statistically significant ($P < 0.05$).

Table 5. Weekly body height (cm) of non-descript goat kids under two management systems

Week	Group A	Group B
1	45.66	45.64
2	46.49	46.42
3	46.94	47.07
4	47.61	47.75
5	48.38	48.35
6	49.16	48.77
7	49.90	49.36
8	50.62	49.73
9	51.72	50.26
10	52.72	50.71
11	53.77	51.30
12	54.68	51.66
Mean	49.81	48.92
SE	0.6432	0.4114
LSD	1.3046	0.8343
P-value	0.04	0.04

Weekly Body Girth

Body girth increased continuously in both groups throughout the experimental period. The mean body girth was 49.95 cm in Group A compared with 48.44 cm in Group B. Group A therefore showed significantly greater body girth than Group B ($P < 0.05$).

Table 6. Weekly body girth (cm) of non-descript goat kids under two management systems

Week	Group A	Group B
1	45.47	45.38
2	46.32	45.84
3	47.05	46.41

Week	Group A	Group B
4	47.68	47.11
5	48.46	47.53
6	49.22	48.06
7	50.01	48.59
8	50.91	49.12
9	51.98	49.70
10	53.18	50.18
11	53.96	51.28
12	55.11	52.10
Mean	49.95	48.44
SE	0.5965	0.3521
LSD	1.2097	0.7141
P-value	0.003	0.003

Economic Performance

Group A showed comparatively better economic performance than Group B. The total production cost was Rs. 3,839 and Rs. 3,936 per kid, while the sale values were Rs. 4,200 and Rs. 4,150, respectively. Consequently, net profit was higher in Group A (Rs. 361/kid) than in Group B (Rs. 214/kid).

Table 7. Economic performance of non-descript goat kids under two management systems

Particulars	Group A	Group B
Feed consumption (kg/kid)	66.08	67.20
Concentrate intake (kg/kid)	16.52	16.80
Concentrate rate (Rs/kg)	32.50	32.50
Concentrate cost (Rs/kid)	536	546
Green fodder quantity (kg/kid)	49.56	50.40
Green fodder rate (Rs/kg)	4.50	5.00
Green fodder cost (Rs/kid)	223	252
Total feed cost (Rs/kid)	759	798
Medication/vaccination (Rs)	120	150
Labour cost (Rs)	240	240
Miscellaneous cost (Rs)	120	150
Initial cost of kid (Rs)	2600	2600
Total cost (Rs/kid)	3839	3936

Particulars	Group A	Group B
Weight gain (kg/kid)	9.39	7.17
Final body weight (kg/kid)	18.17	16.03
Sale value (Rs/kid)	4200	4150
Net profit (Rs/kid)	361	214

Note: Net profit = Sale value – Total production cost.

Discussion

The present study revealed that the maximum average body weight of 14.56 kg per kid was obtained in Group A (semi-intensive management), which was significantly higher than the 12.69 kg recorded for Group B under intensive management. This difference might be attributed to the grazing behaviour of animals and the nutritive quality of available pasture. The present findings are in agreement with Paramasivam *et al.* (2002), who reported that Barbari goats reared under a semi-intensive system showed significantly higher ($P<0.01$) body weight gain compared with those maintained under an intensive housing system. Hassan *et al.* (2015) also supported the present findings while working on 200 Black Bengal goats under extensive and semi-intensive management systems, with 100 goats in each system. They reported significant differences ($P<0.05$) in postpartum and birth weights, with average birth weights of 1.28 ± 0.11 and 1.25 ± 0.10 kg under the respective management conditions. Wijethunga *et al.* (2015) conducted a survey involving 82 farmers using different management systems, including intensive and semi-intensive systems. Their results indicated significant differences ($P<0.05$) in herd size, birth weight, slaughter weight, and growth rate between management systems. Huma *et al.* (2016) conducted an eight-week trial on growth traits and reported that body weight was higher in Group A (8.29 kg) than in Group B (7.75 kg), with a significant difference ($P<0.05$). The maximum body height (49.81 cm) was recorded in goat kids of Group A maintained under the semi-intensive management system, compared with 48.92 cm in Group B under intensive management. These findings are in agreement with Huma *et al.* (2016), who reported a higher body height in male Teddy goats reared under semi-intensive management (40.50 cm) compared with those maintained under intensive management (39.33 cm). The present findings are also comparable with those of Kumbhar *et al.*, 2018; Soomro *et al.*, 2025; Yakub and Atil (2001), who reported a body height of 56.93 ± 0.52 cm in Sonadi goats. In the present study, body girth of non-descript goat kids was higher under the semi-intensive management system (49.95 cm) than under the intensive management system (48.44 cm). Huma *et al.* (2016) similarly reported higher body girth in male Teddy goats reared under semi-intensive management (48.17 cm) compared with those under intensive management (47.50 cm). Das *et al.* (2010) further reported that body weight contributed approximately 69.1% of the variation in adult Kilakarsal sheep. Kosum *et al.* (2003) and Iqbal *et al.* (2013) also supported these findings and reported considerable variation in body conformation traits in response to different feeding and housing systems. The present study also showed that body length of non-descript kids in Group A under semi-intensive management was higher (49.51 cm) than that of kids in Group B under intensive management (47.87 cm). Similar findings were reported by Iqbal *et al.* (2013), who highlighted the importance of body length as an

important conformation trait associated with live body measurements and productive performance. The economic analysis of the present study revealed a higher net profit of Rs. 361/kid in Group A (semi-intensive management) compared with Rs. 214/kid in Group B (intensive management). These findings are in agreement with Huma *et al.* (2016), who reported a net profit of Rs. 316/kid under semi-intensive management compared with Rs. 216/kid under intensive management. Similarly, Fernando Brito Lopes (2012) reported higher economic returns from goats managed under semi-intensive conditions than those maintained under intensive systems, with returns of Rs. 0.18 and 0.14, respectively. Legesse *et al.* (2005) also reported higher economic returns from Somali goats managed under semi-intensive conditions. Furthermore, Huma *et al.* (2016) reported that the net profit was higher in lambs reared under semi-intensive management (Rs. 337/lamb) than in those maintained under intensive management (Rs. 245/lamb). Overall, the present findings indicate that semi-intensive management provided better growth, body conformation, and economic returns than intensive management for non-descript goat kids.

Conclusion

The present study concluded that non-descript goat kids maintained under the semi-intensive management system showed superior body weight, body length, height, and girth compared with those under intensive management. Moreover, semi-intensive management resulted in higher economic returns (Rs. 361/kid) than intensive management (Rs. 214/kid), indicating its greater suitability for improving growth performance and profitability of non-descript goat production.

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