Effect of Different Floor Types on Growth Performance and Feed Conversion Ratio of Mehsana Goat Kids

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Abstract

This study was done to evaluate the effect of different floor types on growth performance and feed conversion ratio of weaned Mehsana goat kids for a period of 84 days. Twenty-seven weaned (3 months old) Mehsana goat kids having nearly identical body weights (10-12 kg) were randomly divided into three uniform groups having 9 kids (4 males and 5 females) in each group and reared on three different types of floors, viz., group A: katcha floor, B: bricks floor, and C: concrete floor. All the kids were reared under standard management system of goat rearing with strict hygiene and various parameters of production performance were recorded. Mean body weights in kids of groups A, B and C were 13.56±0.25, 13.60±0.26, and 13.87±0.27 kg, respectively. The corresponding average daily body weight gains were 35.89±2.74, 34.08±2.24, 39.23±4.10 g/day and feed conversion ratio 09.95±0.70, 08.99±0.52, 08.92±0.81, respectively. The differences among treatment groups were found non-significant for all three parameters. Incidences of disease occurrence and parasitic infestation were not noticed in kids of any group. It may be concluded that provision of different floor types, *viz.,* katcha, bricks and concrete had no significant effect on growth performance, feed conversion ratio, disease incidence and parasitic infestation in the Mehsana kids. Further, from the study it may be inferred that economically weaker farmers may rear their kids on katcha floor with strict hygiene and attain the growth rate at par with other flooring systems.

Key Words: Floor types, Growth performance, Feed conversion ratio, Mehsana goat kids, Gujarat climate

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Introduction

Since the domestication of goat (*Capra hircus*) around 9000 to 7000 BC, it plays an important role in the subsistence of large number of small farmers, marginal farmers and landless labourers. Being a popular livestock species, it is referred to as "poor man's cow" (Sahu *et al.,* 2013). According to the 20th Livestock Census, total goat population is 148.88 million, registering an increase of 10.1% over the quinquennial census (Anonymous, 2019). Gujarat has six well-known recognized goat breeds, among them Mehsana goat is a dual purpose breed of arid and semi-arid climate of north Gujarat. The housing system has a significant effect on body weight in goats (Kumari *et al.,* 2013). Assuring proper housing is one means of modifying stressful environmental conditions and ensuring appropriate growth. The main trouble of kid rearing is the post-weaning poor growth which is significantly affected by housing management (Dadi *et al.,* 2008). Better growth rates appropriate to increase general adaptability and feed conversion ratio of animals is essential for profitable goat farming. Flooring material is a vital component of housing for kids. The essential functions of the flooring material are its ability to abate the extremes of climatic stress and providing favourable microclimatic conditions (Rahman *et al.* 2013). The total estimated cost of concrete floor is higher than the bricks floor, but no cost estimate for katcha floor. In India most of the poor farmers adopt katcha flooring because of poor economic condition. Therefore, the present study was conducted to assess the effect of three different floor types on the growth performance and feed efficiency of weaned Mehsana goat kids.

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Materials and Methods

The present study was carried out on weaning (3 months old) Mehsana goat kids reared at Livestock Research Station, SDAU, Sardarkrushinagar, north Gujarat. Twenty-seven weaned goat kids of nearly identical body weights (10-12 kg) and of either sex were randomly divided into three uniform groups having 9 kids (4 males and 5 females) in each group. They were reared for 84 days (12 weeks) on three different types of floors, *viz.,* katcha floor (group A), bricks floor (group B) and concrete floor (group C) under intensive housing system. For the purpose of this experiment, a single shed (243 sq.ft.) was partitioned equally into 3 pens of 81 sq.ft. each using welded wire mesh, one each had katcha, bricks

and concrete floor for housing respective groups of kids. All the groups were reared under standard management system of goat rearing by group feeding. An adaptation period of 14 days was allowed before the experiment. Daily cleaning and strict hygienic conditions were maintained in the shed. Kids were offered pelleted concentrate feed daily in the morning and *ad libitum* green, dry fodder, and had free access to wholesome, clean drinking water. Regular deworming (at start and end of the experiment) and monitoring of health was carried out in kids of all groups.

For recording growth performance of kids in all the three groups, weekly body weight of all the kids was recorded before offering the feed and water with the help of a digital weighing balance in the morning and growth rate was calculated as per standard formula .

The feed and fodder requirements of the kids were calculated on the basis of the dry matter requirement of the kids. The concentrate was given according to body weight (1% of body weight) per kid daily. The concentrate was offered once in the morning whereas green and dry fodders were provided to kids twice in a day. Every-day morning leftover feed was collected and weighed. The proximate analysis of feeds and fodder (Table 1) used in the study was done as per AOAC (1995), and feed and nutrient intake was calculated.

Feed intake (DM) and FCR was calculated in all the treatment groups as per standard formula. Disease incidences were recorded as and when occurred. To examine parasitic infection faecal samples were collected and screened at every four week interval for parasitic eggs. The sedimentation technique was used for the qualitative faecal examination.

Different growth parameters and FCR were compared between the three groups by the variance partitioning (ANOVA) method and significance was derived at p < 0.05.

Results And Discussion

Average Weekly Body Weight and Daily Body Weight Gain

The weekly body weight changes of kids observed in different groups are presented in Table 2. There was no significant difference in weekly body weight between groups, suggesting that the kids were not under stress. There was a progressive increase in body weights of kids in all groups with advancing age. These findings are in close association with those reported by Thiruvenkadan *et al.* (2008) and Antil *et al.* (2019) in Tellicherry kids and Barbari kids, respectively. These findings however were contradictory with the earlier reports (Kumari *et al.,* 2013; Deshmukh *et al.,* 2017), wherein significantly (p<0.05) faster growth rate was recorded on slotted floor and concrete floor, respectively.

The statistical analysis in Table 2 further indicates that the differences in average daily body weight gain in three floor treatment groups were non-significant. These findings were in close accordance with those reported by Hosam and Tamini (2005) in Black Bedwin goat kids and Singh (2007) in sheep. However, Bharambe and Shinde (2014) found significant effect of flooring in the housing system on average body weight gain in Osmanabadi goat kids. It might be due to difference in breed, geographical location and duration of experiment.

Table 1: Proximate analysis of feeds and fodder used during experiment

Parameters (% DM basis)	Concentrate feed	Green feed	Dry feed
Dry matter	90.00	23.00	87.00
Crude protein	20.10	07.70	15.00
Crude fat	03.29	01.80	02.44
Crude fibre	09.33	27.90	23.00

Table 2: Average weekly body weight (kg) and daily weight gain (g) of weaned Mehsana kids housed under different floor types (n=27)

Weeks	Average weekly body weight (kg)			Average daily weight gain (g)		
	Group-A	Group-B	Group-C	Group-A	Group-B	Group-C
0 (Initial)	12.00±0.73	11.96±0.27	11.93±0.42	--	--	--
1	12.34±0.73	12.29±0.46	12.34±0.45	49.68±2.6	46.67±2.5	59.52±3.1
3	12.99±0.83	12.89±0.58	13.15±0.49	37.14±1.9	34.76±2.8	43.81±3.2
5	13.36±0.89	13.40±0.66	13.80±0.55	29.05±1.7	34.76±2.6	36.51±2.5
7	13.82±0.93	13.89±0.73	14.18±0.59	38.25±2.6	31.75±2.5	26.83±1.7
9	14.27±0.97	14.36±0.65	14.64±0.63	36.98±2.5	30.79±2.7	32.06±2.3
11	14.69±1.03	14.78±0.68	15.19±0.67	29.21±2.3	28.89±2.0	43.33±2.8
12	14.91±1.09	15.00±0.50	15.42±0.65	30.95±2.6	30.95±3.2	32.54±2.7
Mean±SE	13.56±0.25	13.60±0.26	13.87±0.27	35.89±2.74	34.08±2.24	39.23±4.10
P value	0.88[NS]			0.24 [NS]		

NS-Non Significant; Group A, B and C = katcha, bricks and concrete flooring, respectively.

Table 3: Overall performance of kids under different groups during the trial (n = 27)

Attribute	Group-A	Group-B	Group-C	P value
Total feed intake (g/day)	325.4±9.3	324.0±13.4	335.9±7.9	0.70[#]
Feed conversion ratio	09.95±0.70	08.99±0.52	08.92±0.81	0.50[#]
Initial body weight (kg)	12.00±0.73	11.96±0.27	11.93±0.42	0.88[#]
Final body weight (kg)	14.91±1.09	15.00±0.50	15.42±0.65	

[#]NS-Non Significant; Group A, B and C = katcha, bricks and concrete flooring, respectively.

Dry Matter Intake and Feed Conversion Ratio (FCR)

The overall dry matter intake (DMI) of the kids in different groups studied revealed that the mean total feed intake was 325.4±9.3, 324.0±13.4, and 335.9±7.9 g/day in kids of group A, B and C, respectively, showing no significant effect of floor type on DMI (Table 3). Similar results were also reported by Rahman and Nagpaul (2013), Blessy *et al.* (2017) and Antil *et al.* (2017). This could be attributed to the fact that kids could adapt well and were more comfortable on all three floor types. These findings however contradicted the reports of earlier workers (Kumari *et al.,* 2013; Thakur *et al.,* 2017).

The FCR during the experimental period presented in Table 3 revealed that the effect of flooring on feed conversion ratio was found non-significant. These findings supported the earlier reports of Panda *et al.* (2016), Blessy *et al.* (2017) and Antil *et al.* (2019), who reported non-significant effect of different flooring system on FCR. Further, the present findings were in contrast to the earlier observations of Kumari *et al.* (2013) and Deshmukh *et al.* (2017). They found significant difference in the FCR of animals among the different housing systems. It might be due to difference in breed, geographical location and duration of experiment,

Disease Incidence and Parasitic Infestation

In the present investigation, kids were reared under three different types of flooring systems with intensive care and management. Regular deworming (at start and end of the experiment) and monitoring of health was carried out in kids of all groups. None of the kid was therefore reported to have serious health problems during the experiment period. Few kids had mild diarrhea, through fecal examination, it was confirmed that it occurred because of overfeeding, which was controlled immediately by giving a restricted balanced diet. No parasitic infestation was reported during the experiment in any of the kids, which might be attributed to the fact that the kids were not allowed for grazing. These findings are in close accordance with Thiruvenkadan *et al.* (2008) and Kumari *et al.* (2013). They found a non-significant effect of different housing systems on disease incidence and parasitic infestation. However, results are contradictory with the findings of earlier workers (Thakur *et al.,* 2017) where, they found a significant effect of the housing system on disease and parasitic infestation. Variations in results might be attributed to difference in breed, season of experiment, geographical location, management systems and hygienic conditions adopted during the experiment.

CONCLUSION

From the study, it was concluded that provision of different floor types, *viz.,* katcha, bricks and concrete had no effect on growth performance, feed conversion ratio, disease incidence and parasitic infestation in Mehsana goat kids. The production performance of Mehsana kids on katcha floor was at par with brick and concrete floors. Hence, poor, landless farmers and marginal farmers may adopt the katcha flooring system along with strict hygienic measures for optimum growth performances. Further, long term studies are required to gain more insights regarding the effect of floor type on performance and health of goats.

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