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Growth Performance and Body Measurements of Osmanabadi Kids Reared on Different Floorings under Stall Fed Condition

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Abstract

Twenty-eight Osmanabadi kids of 6-7 months age, similar size, body weight (12.58 kg) and either sex was reared on different floorings i.e. T0 – concrete, T1 – soil, T2 – murrum and T3 – sand flooring. The overall means of body weight (kg) of Osmanabadi kids was significantly higher in T2, T1 and T3 than T0. While, the daily growth rate (kg) and body weight gain (kg) of Osmanabadi kids was significantly higher in T1 and T2 than T0 and T3. The overall means of body length for T0, T1, T2 and T3 were 46.63±1.08, 45.42±1.25, 46.95±1.10 and 48.52±1.42 cm, height at wither for T0, T1, T2 and T3 were 57.19±1.06, 54.10±2.11, 58.18±0.94 and 55.16±1.59 cm, chest girth for T0, T1, T2 and T3 were 54.71±1.46, 55.94±1.79, 55.34±2.05 and 55.33±2.05 cm, abdominal girth for T0, T1, T2 and T3 were 58.08±1.83, 58.17±1.47, 60.37±2.03 and 56.83±1.73 cm, respectively. Thus, from above findings, it can be concluded that murum type of flooring material is comparatively superior with other different types of flooring.

Keywords: Body Measurement, Body Weight, Different Floorings, Osmanabadi Kids

Introduction

Goats are one of the oldest domesticated species, and have been used for their milk, meat, hair and skins over much of the world. India with the largest goat population (135.17 million) ranks second in the world and contributes about 26.54% of the total livestock population of India (19th livestock census, 2012). Amongst the goat breeds of India, Osmanabadi goat breed is one of the most popular goat breeds of the arid and semi-arid region of Maharashtra. Historically this breed is known to exist on Deccan Plateau for decades. The name Osmanabadi is derived from its origin area, i.e. Osmanabad district in Maharashtra. The breed is distributed mainly in 2 southern states of India viz. Western Andhra Pradesh and North Eastern Karnataka and are having largest contribution to meat production in southern India as their meat is very tasty when compared with local breeds. Environmental factors especially different types of flooring the shed can be modified for the betterment of animal production and welfare. So, there is a need to develop a suitable floor type for effective housing in goats.

Materials and Methods

The present study was undertaken at Osmanabadi Goat Unit of Red Kandhari Research and Instructional Farm of Department of Livestock Production and Management, College of Veterinary and Animal Sciences, MAFSU, Parbhani (Maharashtra) for duration of 90 days (12 April to 11 July, 2018). Twenty-eight Osmanabadi kids of 6-7 months age, similar size and body weight (12.58 kg) and either sex were randomly divided into four equal groups and housed under four different flooring systems. Kids of T_0 were on concrete flooring, T_1 were on soil floor, T_2 were on murum floor and T_3 were on sand floor. All the four groups were managed under similar system of feeding and management. Body weight of individual animal was recorded in the morning at 6.30 a.m. before feeding and watering, by using electronic weighing balance on weekly interval till completion of the experiment. On the basis of the body weight recorded at weekly interval the average daily body weight gain and weekly body weight gain were calculated. Body measurements of Osmanabadi kids were recorded at weekly interval before feeding and watering with the help of measuring tape for entire duration of study.

The procedure of body measurements like body length (cm), height at wither (cm), heart girth (cm) and abdominal girth (cm) are as follows,

Body length (cm): The horizontal distance measured from point of shoulder to the point of pin bone of the same side.

Height at wither (cm): The vertical distance measured from highest point immediately behind the shoulder to the ground.

Heart girth (cm): The minimum distance of circumference around the chest, ventrally behind the elbow and dorsally behind the point of withers.

Abdominal girth (cm): Abdominal girth was measured as circumference of abdomen encircling in front of hook bones dorsally and in front of udder ventrally.

The data generated were statistically analysed by using Complete Randomized Design (CRD) for various parameters as per statistical methods recommended by Snedecor & Cochran (1994).

Results and Discussion

It is evident from Table 1 that the overall average body weight in Osmanabadi kids were 13.93±0.22, 14.55±0.25, 15.19±0.26, 14.17±0.21 in T_0, T_1, T_2 and T_3 groups, respectively. The highest body weight was recorded in T_2 group. Both the treatment groups T_1 and T_2 are comparable and performance in both the groups are almost similar. As per availability of types of the floor of the farmers it can be recommended that both Soil floor as well as Murum floor has given almost similar performance. Because this particular area is semi-arid zone, where the rain fall is not much, so due to this reason in soil as well as in murum the performance has resulted was almost comparable. These findings are in accordance with those of Kumari *et al.* (2013) reported 13.07 kg body weight at four months age in Osmanabadi kids maintained under house having shed net as roofing material and kaccha floor. However, these findings are in contrast with body weight gain of Tellichery goats from 3-18 months were 21.57±3.43 and

21.63±1.47 kg under mud and slotted floor housing system and body weight gain of Jakhrana kids were 41.26 ± 3.05 kg on soil floor. Thiruvenkadan *et al.* (2009) and Ramachandran *et al.* (2017) in Tellichery goats and Jakhrana kids, respectively. The Analysis of Variance for body weight of Osmanabadi kids on different floorings showed highly significant (P<0.01) differences within treatments and weeks. However, no significant difference was noted in treatment week interactions. The higher body weight of Osmanabadi kids observed in the present study on murum floor may be due to clean animal and good environment due to soaking of the urine in murum which might have resulted in sufficient rest to the animals, thereby increase in higher body weight.

Table 1: Growth performance and body measurement of Osmanabadi kids reared on different floorings

Treatment groups	Growth performance			Body measurement			
	Body weight (kg)	Daily growth rate (kg)	Weekly body weight gain (kg)	Body length (cm)	Height at wither (cm)	Chest girth (cm)	Abdominal girth (cm)
T_0 (Concrete floor)	13.93±0.22	0.030±0.004	0.21±0.03	46.63±1.08	57.19±1.06	54.71±1.46	58.080±1.83
T_1 (Soil floor)	14.55±0.25	0.035±0.005	0.25±0.03	45.42±1.25	54.10±2.11	55.94±1.79	58.17±1.47
T_2 (Murum floor)	15.19±0.26	0.034±0.005	0.24±0.03	46.95±1.10	58.18±0.94	55.34±2.05	60.37±2.03
T_3(Sand floor)	14.17±0.21	0.030±0.003	0.21±0.03	48.52±1.42	55.16±1.59	55.33±2.05	56.83±1.73

The overall means of daily growth rate of Osmanabadi kids for T_0, T_1, T_2 and T_3 groups were 0.030±0.004, 0.035±0.005, 0.034±0.005 and 0.030±0.003 kg, respectively. The highest daily growth rate was recorded in T_1 group. The results of daily growth rate of Osmanabadi kids on soil floor recorded in the present study are in agreement with Kumari *et al.* (2013) reported 105.46±4.63 gm daily growth rate in Osmanabadi kids maintained under house having shed net as roofing material and kaccha floor. The Analysis of Variance for daily growth rate of Osmanabadi kids on different floorings showed highly significant (P<0.01) differences within treatments. However, non-significant differences were noted within weeks and treatment week interactions

The overall means of weekly body weight gain of Osmanabadi kids for T_0, T_1, T_2 and T_3 were 0.21±0.03, 0.25±0.03, 0.24±0.03 and 0.21±0.03 kg, respectively. The highest weekly body weight gain was recorded in T_1 group. These results are in contrast with the results quoted by Patil *et al.* (2008) reported 12.42 kg mean body weight gain in weaned Osmanabadi kids maintained on murum floor with two ventilators + thatch roof, Thiruvenkadan *et al.* (2009) reported 13.40±1.98 kg weekly body weight gain in Tellichery goats maintained on slotted floor housing system. The Analysis of Variance for weekly body weight gain of Osmanabadi kids on different floorings showed highly significant (P<0.01) differences within treatments. However, non-significant differences were noted within weeks and treatment week interactions.

The overall means of body length of Osmanabadi kids for T_0, T_1, T_2 and T_3 were 46.63±1.08, 45.42±1.25, 46.95±1.10 and 48.52±1.42 cm, respectively. The highest body length was recorded in T_3 group. The results obtained in the present study are non-comparable as literature on body length of Osmanabadi kids maintained on different floorings is scanty. However, as Mule *et al*. (2014) reported body length of Osmanabadi kids was 52.05±0.20 cm in males and 45.41±0.22 cm in females respectively, Panda and Ghorpade (2016) reported body length of Osmanabadi kids was 48.64 ± 0.20 cm. The Analysis of Variance for body length of Osmanabadi kids on different floorings showed highly significant (P<0.01) differences within treatments. However, non-significant differences were noted within weeks and treatment week interactions.

The overall means of height at wither of Osmanabadi kids for T_0, T_1, T_2 and T_3 were 57.19±1.06, 54.10±2.11, 58.18±0.94 and 55.16±1.59 cm, respectively. The highest height at wither was recorded in T_2 group. The results obtained in the present study are non-comparable as literature on height at wither of Osmanabadi kids maintained on different floorings is scanty. However, as Mule *et al*. (2014) reported 55.15±0.21 and 52.70±0.26 cm in males and females, respectively, Panda and Ghorpade (2016) reported height at withers of Osmanabadi kids was 53.02 ± 0.14 cm. The Analysis of Variance for height at wither of Osmanabadi kids on different floorings showed highly significant (P<0.01) differences within treatments. However, non-significant differences were noted within weeks and treatment week interactions.

The overall means of chest girth of Osmanabadi kids for T_0, T_1, T_2 and T_3 were 54.71±1.46, 55.94±1.79, 55.34±2.05

and 55.33±2.05 cm, respectively. The highest chest girth was recorded in T_1 group. The results obtained in the present study are non-comparable as literature on chest girth of Osmanabadi kids maintained on different floorings is scanty. However, as Mule *et al*. (2014) reported chest girth of Osmanabadi kids was 45.42±0.28 and 54.28±0.16 cm in males and females, respectively, Panda and Ghorpade (2016) reported chest girth of Osmanabadi kids was 47.29 ± 0.17 cm. The Analysis of Variance for chest girth of Osmanabadi kids on different floorings showed no significant differences within treatments, weeks and treatment week interactions.

The overall means of abdominal girth of Osmanabadi kids for T_0, T_1, T_2 and T_3 were 58.08±1.83, 58.17±1.47, 60.37±2.03 and 56.83±1.73 cm, respectively. The highest abdominal girth was recorded in T_2 group. The results obtained in the present study are non-comparable as literature on abdominal girth of Osmanabadi kids maintained on different floorings is scanty. However, Kuralkar *et al*. (2013) reported abdominal girth (AG) of Berari goats was 76.2 cm. The Analysis of Variance for abdominal girth of Osmanabadi kids on different floorings showed highly significant ($P<0.01$) differences within treatments. However, non-significant differences were noted within weeks and treatment week interactions.

Table 2: Analysis of Variance for growth performance and body measurements of Osmanabadi kids reared on different floorings

Source of Variation	D.f.	Growth Performance			Body Measurements			
		Body Weight	Daily Growth Rate	Weekly body weight gain	Body Length	Height at Wither	Chest Girth	Abdominal Girth
		F-Value	F-Value	F-Value	F-Value	F-Value	F-Value	F-Value
Treatments	3	5.243**	4.487**	4.642**	14.218**	20.006**	0.944	8.844**
Weeks	12	4.017**	1.17	1.165	0.413	0.133	0.208	0.124
Treatments X Weeks	36	0.01	1.38	1.379	0.039	0.097	0.041	0.002
Error	312							

Conclusion

Murum type of flooring material is comparatively superior with other different types of floorings. The results indicated that the Murum and soil type of floorings has significantly higher body weight (kg), daily growth rate (kg) and body weight gain (kg) than sand and concrete flooring systems. However, as a biological factor as the age advances it exhibits increase in body weight gain. The comparably superior performance exhibited by Osmanabadi kids under murum and soil flooring with statistically highly significant differences for growth and body measurements traits may lead to the conclusion that stall-fed goat farmers may adopt this flooring for obtaining maximum profit. Further, long term studies are required to gain more vision regarding the effect of floor type on performance of Osmanabadi goats.

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Conflict of Interests

There is no conflict of interest.

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