EFFECT OF DIFFERENT HOUSING SYSTEM ON THE PHYSIOLOGICAL AND HEMATOLOGICAL PARAMETERS OF OSMANABADI KIDS

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Abstract: The experiment was undertaken at the Red Kandhari Research and Instructional Farm, College of Veterinary and Animal Sciences, MAFSU, Parbhani. In this experiment Twelve Osmanabadi goat kids were separated in the two equal treatment groups of 6 each with 2 males and 4 females kids in each group of 3-4 months of age. One treatment group was assigned for loose housing and other for conventional housing system. The physiological parameters viz Pulse rate, Respiration rate, Rectal temperature showed non significant difference between the two housing group this can lead to a concrete conclusion that almost similar environment was prevailing in both system of housing, and both group of Osmanabadi goat kids exhibited their performance was in different housing system, without much impact of physiological observation. The non significant difference was observed for haematological parameter viz Haemoglobin content and Blood glucose level. It was observed that with an increase in summer temperature blood glucose was also increased.
Keywords: Kids, Conventional, Loose, Physiological, Hematological.

Introduction

Goats constitute an important species of livestock in Asia and contribute greatly to food, rural employment and Gross Domestic Product. Goat raising is one of the important agricultural enterprise particularly in rural parts of this country and have proved very useful to man throughout the ages, largely because of their adaptability to varying environmental conditions under which the breeds and strain types have evolved and in which they are maintained. They have tremendous ability to survive, and often thrive on sparse vegetation unsuitable for feeding of other livestock. Goats can be profitably raised with low investment under intensive and most extensive forms of nomadic grazing. The vast majority of this poorer section of rural population depends on goat rearing for income and certain amount of meat and milk for home consumption. Goat rearing requires low cost and hence suited to

landless labourers, marginal farmers and industrial workers. Hence, an attempt has been made to identify a suitable housing system for economic rearing of kid under intensive management.

Material & method

The experiment was undertaken at the Red Kandhari Research and Instructional Farm, College of Veterinary and Animal Sciences, MAFSU, Parbhani. In this experiment twelve healthy of Osmanabadi goat kids of 3 – 4 months of age, body weight and body measurement were selected from Red Kandhari Research and Instructional Farm, College of Veterinary and Animal Sciences, MAFSU, Parbhani. The kids were provided with standard managemental practices in terms of space and the feed was provided *ad libitum*.

Twelve Osmanabadi goat kids were separated in the two equal treatment groups of 6 each with 2 males and 4 females kids in each group of 3-4 months of age. One treatment group was assigned for loose housing and other for conventional housing system. The space allowed for each kid was 5.38 and 10.76 sq.ft. in convention and loose housing system, respectively.

Physiological Parameters (Body temperature, pulse rate and respiration rate)

For comparing the physiological parameters viz. body temperature (°F), pulse rate (beat per minute) and respiration rate (breath per minute) of Osmanabadi kids observation were recorded on daily basis in both housing system. Rectal temperature was measured by inserting the standard clinical veterinary thermometer deep into the rectum of animal. The thermometer was placed obliquely so as to touch the mucosa of the rectum and was allowed to remain in the rectum for one minute. Pulse rate was measured by palpating the median coccygeal artery on the ventral side of the tail for one minute, using a stop watch and was recorded as beat per minute (bpm). Respiration rate was recorded by counting the gushes of respired air at the back of the palm kept near the nostrils of the kids for one minutes. it was recorded as breath per minute (bpm).

Haematological Parameters (Haemoglobin, Blood glucose)

Haematological parameters *viz.* Haemoglobin, Blood glucose were recorded fortnightly during complete experimental period in both housing system with all standard procedure and precautions. The blood samples were collected and serum sample were preserved for estimation of blood glucose. At each time 2 ml of blood was collected from jugular vein punctured with a sterile hypodermic needle and the sample was collected in a vial. The haemoglobin and blood glucose level estimation was carried out by standard clinical

procedures. The blood Glucose was also estimated with the help of one touch horizontal digital glucometer manufactured by Johnson and Johnson, from freshly collected blood immediately after collection, both the values were reconfirmed from pathology department.

Statistical analysis

The data generated were statistically analysed by using various parameters as per Statistical Analysis recommended by Panse and Sukhatme (1967). The results of the Statistical analysis so obtained were spread over Results and Discussion for interpretation.

Physiological Parameters

The following physiological parameters of Osmanabadi kids under conventional and loose housing system were studied in the present experiment:

Rectal temperature

The average weekly rectal temperature (in ºF) of Osmanabadi kids under conventional housing system for 1-16 weeks were 101.15±0.18, 101.15±0.25, 99.94±0.19, 99.79±0.31, 100.85±0.85, 100.69±0.23, 100.71±0.24, 100.47±0.29, 100.95±0.15, 100.96±0.12, 100.82±0.1, 100.97±0.09, 101.59±0.04,101.52±0.05, 101.5±0.05 and 101.28±0.06 respectively. The overall average rectal temperature of Osmanabadi goat kids under conventional housing system was 101.06±0.29 ºF.

The average rectal temperature (ºF) of Osmanabadi goat kids under loose housing system for 1-16 weeks were 101.39±0.16, 100.95±0.13, 101.02±0.37, 101.00±0.27, 100.91±0.18, 101.03±0.21, 100.82±0.15, 100.61±0.18, 100.93±0.17, 100.93±0.14, 100.95±0.09, 101.2±0.14, 102.02±0.07, 102.1±0.14, 102.16±0.12 and 101.52±0.16 respectively. The overall rectal temperature of Osmanabadi goat kids under loose housing system was 101.28±0.17 ºF.

The overall average rectal temperature of Osmanabadi goat kids under conventional housing system was non significant to that of loose housing system. These findings are in contrast with those reported by Singh *et al*., (2008); Bhatta and Chowdhary (2005).

The range of rectal temperature observed for conventional and loose housing system was 99.7 to 101^{0}F and 100.95 to 102.16^{0}F respectively. The temperature started rising from 8AM onwards in both the housing group, when the temperature was lower animal were comfortable in both the system of housing but when temperature exceeds 25^{0}C mostly during afternoon hours the depressive effect of ambient temperature was exhibited (Morrison,1983; Han 1992; Han 1994) resulting in decrease feed intake increase the water intake by the animal. It was observed during higher temperature animals were seeking at cooler places in

case of loose housing system where as in conventional animals were seeking, panting and were trying to ameliorate the heat. This is impact of high temperature.

Body temperature is determined by heat input from metabolic heat production and solar radiation and through evaporative and non evaporative ameliorate. When heat loss does not attain heat gain heat stored, thus causing an increase in body temperature. (Braush*et al*., 1998)

Respiration rate

The average weekly respiration rate (per minute) of Osmanabadi kids under conventional housing system for 1-16 weeks were 30.73± 0.73, 32.16±0.47, 33.47±0.5, 32.76±0.4, 32.52±0.43, 32.83±0.63, 32.52±0.43, 33.85±0.43, 33.66±0.62, 34.07±0.3, 33.61±0.49, 33.97±0.39, 34.64±0.33, 34.81±0.26, 34.26±0.39 and 34.00±0.39 respectively. The overall weekly average respiration rate of Osmanabadi goat kids under conventional housing system was 33.49±0.46/min.

The average weekly respiration rate (per minute) of Osmanabadi kids under loose housing system for 1-16 weeks were 31.95±0.73, 31.59±0.77, 33.09±0.42, 32.97±0.39, 33.52±0.5, 33.95±0.27, 34.35±0.71, 32.88±0.67, 33.61±0.57, 33.83±0.27, 33.52±0.44, 33.69±0.17, 33.64±0.52, 34.47±0.24, 34.14±0.49 and 33.57±0.2 respectively. The overall weekly average respiration rate of Osmanabadi goat kids under loose housing system was 33.42±0.17/min.

The overall average respiration rate of Osmanabadi kids did not differ significantly between conventional and loose housing system. The non significant difference for respiration rate was observed between the conventional and loose housing system group for Osmanabadi kids. These findings are in contrast to the findings of Singh *et al*., (2008); Patil *et al*., (2008). The increased respiration rate is one of the first reaction of the animal to the increased environmental temperature stress. The increased respiration rate due to heat stress enables the animal to dissipate the excess body heat by vapourizing more moisture through expired air (Alnarmy *et al*., 1992), The animal dissipates excess body heat by evaporating cooling it also utilizes increased respiration rate as a mean to cool the body, where as the lower respiration rate during rainy or winter season helps in conservation of heat in animal body. It can be inferred that the loose housing system was more comfortable for the growth of Osmanabadi kids.

Pulse rate

The average weekly pulse rate (beats per minute) of Osmanabadi kids under conventional housing system for 1-16 weeks were 77.95±0.51, 78.09±0.29, 79.04±0.54, 78.57±0.57, 79.95±0.85, 80.66±0.62, 80.92±0.46, 81.50±0.88, 80.09±1.12, 81.47±0.84, 78.42±0.12, 79.19±0.83, 78.33±0.62, 78.52±1.60 and 79.21±0.92 respectively. The overall weekly average pulse rate of Osmanabadi goat kids under conventional housing system was 79.92±0.09/min.

The average weekly pulse rate (beats per minute) of Osmanabadi kids under loose housing system for 1-16 weeks were 80.09±0.43, 83.21±0.19, 80.69±0.77, 80.50±0.34, 80.35±0.82, 81.14±0.52, 80.33±0.86, 80.92±0.42, 80.64±0.42, 81.52±0.70, 79.11±0.36, 78.66±0.44, 79.42±0.70, 78.52±0.19, 79.71±0.58 and 78.85±0.65, respectively. The overall weekly average pulse rate of Osmanabadi goat kids under loose housing system was 80.23±0.27 /min.

The overall average pulse rate of Osmanabadi kids under conventional housing system was non significant to that of loose housing system. From the table it is revealed that the loose housing system has higher pulse rate in comparision with conventional housing system. Therefore the high level of stress was there on animals reared under loose housing system. When the temperature was elevated above 25^0C, there was depressed pulse rate trend the pulse rate of most of the animal increased sharply at 40^0C environment. This might be due to stress induce by high temperature that was not present when the environment temperature was below 35^0C (the pulse rate in 3 out of 4 was 60 % higher). The rise in pulse rate with increase air temperature, observed in the present study is in agreement with (Raghavan and Malik, 1961; Mehrotra and Malik 1959) who has noted that goat have to take their physiological processes to overcome heat absorbed from atmosphere

Haematological Parameter

Following haematological parameters of Osmanabadi kids under conventional and loose housing system were studied in the present investigation:

Haemoglobin

the group haemoglobin content (gram percent) of Osmanabadi kids under conventional housing system for 1 day to 105 days at fortnightly interval were 8.96±0.031, 9.50±0.34, 9.26±0.36, 9.03±0.25, 9.56±0.27, 8.86±0.18, 9.10±0.32, 9.43±0.34 and 8.86±0.36, respectively. The overall fortnightly average haemoglobin content of Osmanabadi goat kids under conventional housing system was 9.17±0.09 gram percent.

The average haemoglobin content (gram percent) of Osmanabadi kids under loose housing system for 0 day to 120 days at fortnightly interval were 9.00±0.19, 9.03±0.35, 9.83±0.37, 8.70±0.19, 8.90±0.37, 9.00±0.42, 8.33±0.52 8.83±0.31 and 8.86±0.31 respectively. The overall fortnightly average haemoglobin content of Osmanabadi goat kids under loose housing system was 8.14±0.14 gram percent. There was no significant difference for haemoglobin content for Osmanabadi kids in different housing system. These findings are in line with the findings of Singh *et al*., (2008) in Marwari and Patanwadi sheep, Mahalwar *et al*., (2004); Prakash and Rathore (1991) and Sayed (1994). The observed values were lower than reported by Singh *et al*., (2008).

4.4.2 Blood glucose level

The group average blood glucose content (mg/dl) of Osmanabadi goat kids under conventional housing system for 0 day to 105 days at fortnightly interval were 47.56±0.28, 48.41±0.19, 51.08±0.23, 48.63±0.21, 48.70±0.10, 47.19±0.11, 46.68±0.13, 46.67±0.13 and 46.27±0.13 respectively. The overall fortnightly average blood glucose level of Osmanabadi kids under conventional housing system was 47.24±0.64 mg/dl.

The average blood glucose content (mg/dl) of Osmanabadi kid under loose housing system for 0 day to 105 days at fortnightly interval were48.14±0.27, 49.78±0.24, 46.02±0.19, 49.12±0.18, 50.71±0.14, 49.23±0.12, 50.12±0.21, 46.83±0.12 and 46.60±0.13, respectively. The overall fortnightly average blood glucose level of Osmanabadi kids under loose housing system was 48.50±0.55 mg/dl.

The blood glucose level didn't differ significantly among the treatment groups for Osmanabadi kids. However the blood glucose level showed increases trend when animals were exposed to sun during the summer season as compared to animals kept under shade.

These findings are in agreement with report of Singh *et al*., (2008) in Marwari and Patanwadi ewes. They concluded that blood glucose level increased when animals were exposed to sun during summer season as compared to animals kept under shade. This findings support the present work, in which the blood glucose level in experimental animal in loose housing system was increased as compared to Conventional housing system. These observed values of blood glucose is slightly higher than that reported by Singh *et al*., (2008). It can be revealed that the blood glucose levels of kids are affected by different housing systems.

SUMMARY AND CONCLUSION

The weekly mean average rectal temperature of Osmanabadi kids under conventional housing system was 101.06±0.29ºF and in loose housing system was 100.28±0.17ºF.

The weekly average respiration rate of Osmanabadi kids under conventional housing system was 33.49±0.46/min and in loose housing system is 33.42±0.17/min. The overall weekly average pulse rate of Osmanabadi kids under conventional housing system was 79.92±0.09 beats/min and in loose housing system was 80.03 ±0.27 beats/min. The overall fortnightly average haemoglobin content of Osmanabadi kids under conventional housing system was 9.17±0.09 gram percent and in loose housing system was 8.14±0.14 gram percent. The overall fortnightly average blood glucose level of Osmanabadi kids under conventional housing system was 47.24±0.64 mg/dl and in loose housing system was 48.50±0.55 mg/dl. The physiological parameters viz Pulse rate, Respiration rate, Rectal temperature showed non significant difference between the two housing group this can lead to a concrete conclusion that almost similar environment was prevailing in both system of housing, and both group of Osmanabadi goat kids exhibited their performance was in different housing system, without much impact of physiological observation. The non significant difference was observed for haematological parameter viz Haemoglobin content and Blood glucose level. It was observed that with an increase in summer temperature blood glucose was also increased.

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