

Effect of bedding and jacketing on the growth and physiological response of buffalo heifers during winter

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Studies in India and abroad on winter management of buffalo indicated the importance of traditional systems like bedding and jacketing due to their cost-effectiveness and easy availability of raw materials (Rohilla and Ram, 1990; Yadav *et.al.*, 1990). The reports on the growth and physiological response of buffalo heifers with respect to cold stress management are scarce in the literature. Keeping above in mind, the present work was envisaged to evaluate effect of bedding and jacketing on the growth and physiological response of buffalo heifers.

Eighteen Murrah buffalo heifers between 20 and 35 months of age maintained at the Cattle and Buffalo Farm, IVRI, Izatnagar, were used for the study.

The experiment was conducted for a period of three months from December 2004 to February 2005. The animals were divided into three equal groups based on the age and body weight *viz.* T₁ – control (without bedding and jacketing), T₂ – provided with paddy straw bedding of 10 cm thickness and T₃ – provided with bedding (as in T₂) and jacketing with jute gunny bags.

Jute gunny bags were stitched and woven with the polyethylene sheets to prepare jacket with straps of cotton threads left on both sides for tying. The jacket was tied to the animal's body with the gunny bag inside and the polyethylene sheets outside from 5 p.m. to 9 a.m. daily and were removed at 9 a.m. before the animals were let into the paddock. The animals in each group were maintained in separate conventional barn (tail to tail system) situated away from each other to avoid the treatment effect. Daily recording of environmental temperature (maximum and minimum) and humidity (wet and dry bulb reading) was done at 9 a.m. and 2 p.m. for the entire study period.

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The animals were weighed individually in a weigh bridge before feeding and watering in the morning at weekly intervals throughout the experimental period. Physiological constants such as rectal temperature, respiratory and pulse rates were recorded as per the standard procedure at fortnightly intervals for two consecutive days at 6 a.m. and 2 p.m. The data obtained from the study were analyzed and subjected to test of significance and correlation as per the method described by Snedecor and Cochran (1994).

Bedding and jacketing on the growth and physiological response of buffalo heifers

Average weight gain during the experimental period was highest in T₃ (40.83±7.24 kg), followed by T₂ (40.00 ±5.63 kg) and T₁ (38.33 ±6.67 kg). The average daily gain was maximum in T₃ (453.70±80.40 g/day) and was least in T₁ (425.93±74.07 g/day). This might be due to the fact that animals in T₃ group were more comfortable and warm as compared to the other two groups due to the provision of both bedding and jacketing. However, there was no significant difference in average daily gain (ADG) and average weight gain per animal among the groups. These findings are in agreement with the report of Prasanna (2002) and Yadav *et al.* (1990) who concluded that the ADG was highest in bedding along with jacketing group (419 g), followed by calves given only bedding (335 g), control (200 g) and jacketing (185 g).

The morning and afternoon rectal temperatures were not significant among treatment groups (Table 1). However, the difference in the rectal temperature between morning and afternoon differed significantly (P<0.01) among the treatment groups. Similar findings were also reported by several others (Rohilla and Ram, 1990; Prasanna, 2002). Shinde (1997) reported that rectal temperature was lower (P<0.05) in control group (37.81 °C) than conventional housing + paddy straw bedding group (38.06 °C) and conventional housing + jacketing with gunny bag sheets during night group (38.09 °C). This may be due to the fact that the animals in treatment

Table 1. Effect of cold ameliorative measures on the physiological responses of buffalo heifers

Groups	Rectal temperature (°C)			Pulse rate (beats/minute)			Respiration rate (counts/min)		
	6 AM	2 PM	Difference	6 AM	2 PM	Difference	6 AM	2 PM	Difference
T ₁	37.74±0.05	38.20±0.32	0.46±0.25 ^y	51.26±0.45	48.01±0.45	-3.25±0.19	19.33±0.46 ^b	15.35±0.43	-3.99±0.42
T ₂	37.73±0.04	38.14±0.40	0.40±0.22 ^y	51.76±0.46	48.81±0.44	-2.96±0.14	18.79±0.45 ^{ab}	15.11±0.38	-3.68±0.39
T ₃	37.79±0.04	38.12±0.36	0.32±0.27 ^x	50.42±0.57	47.57±0.51	-2.85±0.20	17.81±0.55 ^a	14.54±0.45	-3.26±0.28

^{x,y} Means bearing different superscripts within each column differ significantly (P<0.01); ^{a,b} means bearing different superscripts within each column differ significantly (P<0.05).

groups were protected from cold by jacketing (T₃) and bedding (T₂) as well as kept in sheds protected from cold winds during night.

It is clearly evident from Table 1 that the difference in pulse rate between the morning and afternoon was found highest in the control group when compared to the treatment groups. However, the morning, afternoon and the difference between morning and afternoon pulse rates did not differ significantly between treatment groups. Similar findings were reported by others (Rohilla and Ram 1990, Prasanna 2002). In contrast, Shinde (1997) reported that pulse rate was higher in control group (54.03 beats/minute) than conventional housing + paddy straw bedding group (55.53 beats/minute) and conventional housing + jacketing with gunny bag sheets during night group (54.68 beats/minute).

The respiration rate during the morning hours was significantly (P<0.05) higher in control group when compared to the treatment groups (Table 1). It decreased during the afternoon hours in all the three groups but did not differ significantly between the groups. However, the difference in the respiratory rate between morning and afternoon periods was higher in T₁ group when compared to T₂ and T₃, which did not differ significantly between the treatment groups. Similar findings were also reported by others (Rohilla and Ram 1990, Prasanna 2002). They concluded that there was no significant effect of jacketing on respiration rate.

SUMMARY

A study was conducted to evaluate the effect of bedding and jacketing on the growth and physiological responses of

buffalo heifers. Eighteen Murrah buffalo heifers between 20 and 35 months of age were divided into 3 equal groups viz. T₁, control; T₂, provided with paddy straw bedding; and T₃, provided with bedding and gunny bag jacketing. Results indicated that provision of bedding and jacketing had significant effect on rectal temperature, but did not affect growth, pulse and respiration rates of buffalo heifers.

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