EFFECT OF DIFFERENT HOUSING SYSTEMS ON BIOCHEMICAL PARAMETERS IN BUFFALOES DURING WINTER SEASON

Garkal R. A, P. M Kekan

Department of Veterinary Physiology

College of Veterinary and Animal Sciences, MAFSU, Parbhani- 431402(M.S) India.

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Corresponding Author : drprakash73@gmail.com

ABSTRACT

An experiment was conducted to study the effect of different housing systems on biochemical parameters in buffaloes during winter season. Twelve buffaloes were selected and randomly divided into two equal groups. Animals of group – A were housed in shed with net and animals of group – B to shed without net. There was significant ($p<0.05$) difference in THI between both the shed. The mean values of glucose and total cholesterol were significantly ($p<0.01$) higher in group A as compared to group B. Whereas, the mean values of total protein and globulin were non significantly higher, albumin and A:G ratio was non significantly lower in group A as compared to group B.

KEY WORDS: Housing systems, Biochemical parameters, Buffaloes, cattle

INTRODUCTION

In India, we find different types of animal houses constructed without careful planning and designing and not much attention is paid to this important aspect which plays a major role in the production performance of the livestock. The species has well adapted to the harsh climate and nutritional conditions. However, the effects of heat stress have proven to be a great hindrance to their production and productivity in buffaloes and hence require special housing need. The buffalo housing should be well ventilated, protected from cold and hot weather. Keeping this in view the present study was conducted to evaluate the biochemical changes in buffaloes maintained under two different housing systems shed with net and without net.

MATERIALS AND METHODS

The experiment was conducted on 12 adult she buffaloes maintained at Buffalo Breeding Farm, College of Veterinary and Animal Sciences, Parbhani. The animals were divided into two groups viz. Group A and Group B having six animals in each group . The buffaloes reared in net shed (is a concept that shed is totally covered with 40 mm mesh to protect animals from bites of flies and is provided with a hurricane type of ventilator) were designated as group A and buffaloes reared in shed without net (conventional shed without net and hurricane ventilator) were designated as group B. All the buffaloes selected in this study were apparently healthy and free of any parasitic infestations and other disease conditions.

The local climate of winter is from 5th Nov. to 4th March Dry and wet temperatures were recorded at 07.30 am and 02.30 pm hrs using wet and dry bulb thermometer, in shed with net and shed without net. The temperature humidity index was calculated by using formula of McDowell (1972).

THI = 0.72 (DBT + WBT) + 40.6

Collection of blood samples:

Blood samples were collected between 07.00 to 08.00 hrs at fortnightly intervals of both the groups. 8 to 10 ml of blood was collected in a test tube from jugular vein puncture for separation of serum. The biochemical parameters such as glucose, total cholesterol, total protein, albumin, globulin and A:G ratio was estimated by using commercial kits and biochemical analyser . Statistical analysis of data was done by applying student “t” test (Snedecor and Cochran, 1967).

RESULTS AND DISCUSSION

It is revealed from the table 1 that the mean value of glucose were significantly (P<0.01) higher in group A (54.15±0.44) than that of group B (50.19±0.05). In the present study the glucose concentrations were higher throughout the winter and suddenly decreased in last week of February during shifting of winter to summer season. The THI were also higher during this period in both the groups. Similarly, Joshi *et al*. (2012) stated that hot and cold conditions function as stressors to the animals where by increasing glucocorticoid secretion, which induces gluconeogenesis and inhibits peripheral utilization of glucose, and thus increase or maintains the blood glucose in stressed animals.

Table 1 : Effect of two housing systems on biochemical parameters in buffaloes during winter

Parameter	Group A	Group B
Glucose (mg/dl)	54.15**±0.44	50.19±0.05
Total cholesterol (mg/dl)	58.84**±1.02	55.76±0.66
Total protein (g/dl)	8.79±0.66^{NS}	8.53±0.15
Albumin (g/dl)	3.27±0.15^{NS}	3.49±0.29
Globulin (g/dl)	5.65±0.89^{NS}	5.29±0.56
A:G ratio	0.74±1.26^{NS}	0.97±0.74

*P<0.05, ** P<0.01, NS-Non significant

Total cholesterol in group A was significantly (P<0.01) higher as compared to group B, which may be due to hormonal changes or change in acetate concentration which is primary precursor for the synthesis of cholesterol . Total protein in group A (8.79±0.66) were non significantly higher than group B (8.53±0.15). Myer and Harvey (1998) estimated higher globulin concentration in cattle during winter as compared to summer season, which could be due to dehydration during winter season, which may have elevated the concentration of plasma protein and globulin. Accordingly the overall mean values of A:G ratio were higher in group B (0.97±0.74) and lower in group A (0.74±1.26).

Temperature humidity index (THI) has been widely used as a heat stress index in buffaloes with values below 72 considered to be comfortable; 72-78 as mild; 78-88 as moderate and above 88 as extremely stressful. It is observed that THI of group A and group B were 80.44±0.56 and 78.71±0.26, respectively considered as moderate stressful to buffaloes. THI of 66.63±0.45 at morning of group A indicated that shed with net house though showing higher THI but was in normal physiological range which do not exhibit any discomfort to animals of both the groups.

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