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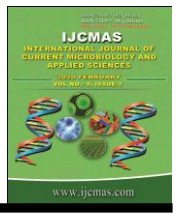

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Study of Physiological Traits of Sambalpuri Buffalo

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A B S T R A C T

Buffaloes are vital dairy animals in India. Sambalpuri buffalo is a lesser known breed of Odisha. This study was carried out in 10 villages of Sambalpur and Bargarh districts of Odisha. The physiological traits were studied before and after work. Statistical analysis was done based on sex and locality of the buffalo population under study. Least squares analysis of mean of rectal temperature after work revealed that there was no significant difference between localities but there was significant difference between sexes ($p<0.01$). Similarly, least squares analysis of mean of respiration rate after work showed that there was no significant difference between localities. However there exist significant difference between sexes ($p<0.01$).Least squares analysis of mean of pulse rate after work reveals that there was no significant difference between localities and between sexes. The physiological characters can be improved through direct selection methods and this breed can be registered as a separate dual purpose breed.

Introduction

Buffalo has a vital role in the agricultural economy of many developing countries by providing milk, meat and draught power. Buffaloes contribute to 51.2% of total milk production in India (Bhat, 2010). India has the highest number of buffaloes in the world. There are 16 registered breeds till date. There are a lot more buffalo population which can be registered as a breed in near future. Sambalpuri buffalo is one of them. These are predominantly found in Sambalpur and Bargarh districts of Odisha. Air temperature of 13-18^{0}C, RH of 55-65% and wind velocity of 5-8 km/h are optimum for buffaloes (Payne and Payne, 1987).

Materials and Methods

Selection of animals

This investigation was carried out in 10 villages of Sambalpur and Bargarh districts of Odisha. By visiting the farmers in the villages namely Charmal, Natidaul, Ghusarmal, Kamalanali, Andrapada, Bahubasa, Sannuapali, Badbil, Luhapank and Jhatukimal from 3 blocks of above districts, the data on physiological traits of buffaloes were collected. The data was collected by personally measuring each of the parameters using suitable methods. A total of 80 male buffaloes and 76 female buffaloes were taken for study.

Estimation of physiological parameters

Thermometer was gently inserted into the anus, making an angle so that it touches the wall of rectum. The thermometer is held in pace for half a minute. This measured the rectal temperature in ^{0}F. Pulse rate was measured from femoral artery. Respiration rate was measured by counting the flank movement for a minute. These parameters were measured before and after work.

Statistical analysis

The data analysis was done using IBM-SPSS 23.0.Significance in between the two localities and sexes with respect to different characters were studied by using t-test.

Results and Discussion

Table 1 show the least square means with standard error of physiological traits of adult Sambalpuri buffaloes. The overall least square mean of rectal temperature (Before Work) was 100.36±0.07°F. The rectal temperature in buffaloes of Sambalpur and Bargarh was found to be 100.41±0.08°Fand 100.27±0.14°F and in male and female buffaloes was found to be 100.47±0.10°Fand 100.21±0.13°F respectively. Least squares analysis of mean reveals that there was no significant difference between localities but significant differences exists between sexes ($p<0.01$).The overall least square mean of rectal temperature (After Work) was 102.99±0.88°F. The rectal temperature in buffaloes of Sambalpur and Bargarh was found to be 102.96±0.86°F and 102.88±1.22°F and in male and female buffaloes was found to be 102.86±0.80°Fand 102.98±10.91°F respectively. Haque *et al.,* 2012 studied on murrah buffaloes and found that under stress conditions the normal rectal temperature is highly increased which supports the present research but in contrast to this normal rectal temperature of buffalo by Barros *et al.,* in Brazil was found to be 100.3±1.40 °F. Least squares analysis of mean reveals that there was no significant difference between localities and sex.

The overall least square mean of respiration rate (Before Work) was 11.26±0.07/min. The respiration rate in buffaloes of Sambalpur and Bargarh was found to be 11.18±0.08/min and 11.43±0.13/min and in male and female buffaloes was found to be 11.41±0.09/min and 11.21±0.12/min respectively. Least squares analysis of mean reveals that there was no significant difference between localities and between sexes. The overall least square mean of respiration rate (After Work) was 13.85±0.09/min. The respiration rate in buffaloes of Sambalpur and Bargarh was found to be 13.80±0.09/min and 13.92±0.17/min and in male and female buffaloes was found to be 14.19±0.12/min and 13.53±0.15/min respectively. The findings are supported by Haque *et al.,* (2012), who studied the alteration in respiratory rate in adult Murrah buffaloes and found that the respiration rate increases significantly under stress**.**

Table.1 Least square means with standard error of physiological traits of adult Sambalpuri buffaloes (locality wise and sex wise)

		Locality wise			Sex wise			
Sl. No.	**Traits**	**Sambalpur (116)**	**Bargarh (40)**	**t_l-value**	**Male (80)**	**Female (76)**	**t_s-value**	**Overall (156)**
1	Rectal temp. (BW)℃F	100.41±0.08	100.27±0.14	0.442	100.47±0.10	100.21±0.13	7.936**	100.36±0.07
2	Rectal temp. (AW) °F	102.96±0.86	102.88±1.22	0.335	102.86±0.80	102.98±10.91	0.815	102.99±0.88
3	Respiration rate (BW)/min	11.18±0.08	11.43±0.13	3.912	11.41±0.09	11.21±0.12	3.325	11.26±0.07
5	Respiration rate (AW)/min	13.80±0.09	13.92±0.17	1.819	14.19^{a}±0.12	13.53^{b}±0.15	11.992**	13.85±0.09
6	Pulse rate (BW)/min	49.47±0.09	49.50±0.17	0.861	49.81±0.12	49.15±0.15	18.366**	49.49±0.08
7	Pulse rate (AW)/min	52.29±0.09	51.93±0.17	0.835	52.56±0.12	51.65±0.15	2.455**	52.21±0.08

Figures in parentheses indicate number of observations
*the values are significant at $p<0.05$
**the values are significant at $p<0.01$
t_s= t value of sex
t_l= t value of locality

Least squares analysis of mean reveals that there was no significant difference between localities. However there exist significant difference between sexes ($p<0.01$).

The overall least square mean of pulse rate (BW) was 49.49±0.08/min. The pulse rate in buffaloes of Sambalpur and Bargarh was found to be 49.47±0.09/min and 49.50±0.17/min and in male and female buffaloes was found to be 49.81±0.12/min and 49.15±0.15/min respectively. Least squares analysis of mean reveals that there was no significant difference between localities but significant difference exists between sexes ($p<0.01$). The overall least square mean of pulse rate (After Work) was 52.21±0.08/min. The pulse rate in buffaloes of Sambalpur and Bargarh was found to be 52.29±0.09/min and 51.93±0.17/min and in male and female buffaloes was found to be 52.56±0.12/min and 51.65±0.15/min respectively. Least squares analysis of mean reveals that there was no significant difference between localities but significant differences exist between sexes. The physiological characters can be improved through direct selection methods. This can be registered as a separate breed of buffalo. The Government must take necessary steps for the preservation of this indigenous germplasm.

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