HAEMATOLOGICAL ATTRIBUTES OF BHADAWARI BUFFALO BULLS AT INITIAL STAGE OF SEMEN PRODUCTION[#]

Amitosh Kumar[1], Pavan Goyal[2] and Rakesh Goel
Department of Animal Genetics and Breeding, College of Veterinary and Animal Science
Rajasthan University of Veterinary and Animal Sciences, Bikaner-334 001, Rajasthan, India

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ABSTRACT

In the present investigation, haematological attributes viz. haemoglobin (Hb), total erythrocyte count (TEC), total leucocyte count (TLC) and differential leucocyte count (DLC) were studied in 100 blood samples collected from 10 Bhadawari buffalo bulls. The overall average for haemoglobin, total erythrocyte count and total leucocyte count was found to be 10.33±0.25 g/100 ml, 9.19±0.23 million/mm3 and 6.37±0.18 thousand/mm3, respectively. Differential leucocyte count revealed the mean values of neutrophils, lymphocytes, monocytes and eosinophils as 38.97±0.75, 58.09±0.68, 1.52±0.09 and 1.25±0.08 per cent of leucocytes, respectively. Bulls varied significantly (P<0.01) for Hb concentration, TEC and TLC. Significant difference between bulls was also observed for lymphocytes and neutrophils.

***Key words*:** Haematology, buffalo, haemoglobin, erythrocyte, leucocyte

Introduction

With globalization, the dairy industry has witnessed an increased demand for semen from superior and healthy buffalo-bulls. Beside the seminal attributes of the bull, certain haematological attributes indicates health status of the bulls. Leucocytes are mobile units of body protecting system and are formed in bone marrow and in the lymph nodes from where they are transported in the blood to the different parts of body and are to be used as rapid potent defence against any infectious agent. Low haemoglobin results in anaemic condition of the animals and these animals are susceptible to many diseases. Reports regarding haematological parameters of Bhadawari animals are very scanty. So keeping in view this objective, present investigation was undertaken.

Materials and Methods

The study was conducted on 10 Bhadawari bulls, belonging to NATP project, aged between 3.5-4 years maintained in identical optimal management and feeding conditions at dairy farm, College of Veterinary Science and Animal Husbandry, Mathura. In all 100 blood samples (10 samples from each of 10 Bhadawari bulls, 274.8 to 480.5 Kg body weight) were taken. The estimation of haemoglobin, total erythrocyte count (TEC) and total leucocytes count (TLC) were carried out according to the standard procedures. TEC and TLC were performed by blood samples (diluted 1:100) charged in haemocytometer under 40X and 10X, respectively. The TEC was done in 80 tertiary squares (one central and four corner secondary squares) and TLC in four primary squares simultaneously using RBC diluting pipette, WBC diluting pipette and diluting fluids, respectively.

For DLC blood smears were stained using Lieshman's stain. About 100 WBC were usually categorized at 100X magnifications. Different cells were identified and tabulated during examination of the uniform thin area of the smear and per centage of each type of cell was calculated. Statistical analysis of the data for all haematological attributes was done as described by Snedecor and Cochran (1994).

Results and Discussion

Mean values for haemoglobin, total erythrocyte count, total leucocyte count and differential leucocyte count in the blood of Bhadawari bulls are presented in Table 1.

The overall average value for haemoglobin was found to be 10.33±0.25 g/100 ml. The range was 6.78±0.25 to 13.34±0.30 g/100 ml. The analysis of variance (ANOVA) (Table 2) showed significant (P<0.01) difference between bulls in haemoglobin concentration. Highest haemoglobin concentration (13.34±0.30) was observed in the blood of bull number 5 and it was not significantly different from bull number 10. Lowest haemoglobin concentration (6.78±0.25) was found in the blood of bull number 1 and was not significantly different from bull number 14. Non-significant difference was observed in haemoglobin concentration of bull number 3, 7 and 21. These results are in close agreement with the findings of Ram (1979) for Bhadawari calves. However, Chandra *et al*. (2008) observed a lower haemoglobin concentration (9.45±0.22 g/dl) in graded Murrah buffaloes and Hagawane *et al.* (2009) also reported 9.08±0.32 a lower haemoglobin concentration in Nagpuri buffaloes.

Mean value of total erythrocyte count was observed to be 9.19±0.23 million/mm^3. The range of value was 5.83±0.32 to 11.83±0.31 million/mm^3. The analysis of variance (Table 2) revealed significant (P<0.01) difference between bulls for TEC. Similarly, Ram (1979) reported number of RBC in the range of 7.82 to 9.36 million/mm^3 in the blood of Bhadawari calves. While, Sharma *et al*. (1985) reported lower values of TEC (6.95±0.73) for adult Murrah bulls. Similarly, Chandra *et al*. (2008) found comparatively lower value of TEC in graded Murrah buffaloes. Patel *et al.* (2016) reported higher value of TEC in Banni buffaloes. The overall average

[#1]Part of M.V.Sc. Thesis of first author submitted to the CSA University, Kanpur, E mail: amitosh-_mathura@hotmail.com; [2]M.V.Sc. Scholar, Department of Epidemiology and Preventive Veterinary Medicine, CVAS, RAJUVAS, Bikaner.

Table1: Mean values for haematological attributes of Bhadawari bulls

Bull No.	Hb (g/dl)	TEC (10^6/ mm^3)	TLC (10^3/ mm^3)	DLC (%)				
				Eosino phils	Baso phils	Lympho cytes	Mono cytes	Neutro Phils
1	6.78^{a} ±0.25	5.83^{a} ±0.32	2.69^{a} ±0.09	1.5 ±0.34	0.00 ±0.00	57.70^{b} ±1.74	1.5 ±0.17	38.50^{abc} ±1.8
3	11.19^{c} ±0.52	9.97^{b} ±0.41	5.59^{b} ±0.13	1.2 ±0.24	0.00 ±0.00	55.30^{ab} ±0.66	1.6 ±0.22	40.70^{bc} ±1.11
5	13.34^{d} ±0.3	11.83^{c} ±0.31	6.10^{bc} ±0.09	0.9 ±0.17	0.00 ±0.00	47.70^{a} ±2.9	1.7 ±0.26	44.20^{d} ±2.99
7	11.18^{c} ±0.45	9.78^{b} ±0.43	6.69^{cd} ±0.72	1 ±0.21	0.10 ±0.10	63.70^{b} ±0.89	1.9 ±0.34	33.20^{a} ±0.79
9	9.70^{b} ±0.51	8.84^{b} ±0.55	8.43^{f} ±0.07	1.3 ±0.15	0.00 ±0.00	59.80^{b} ±2.4	1.8 ±0.29	37.10^{ab} ±2.7
10	13.07^{d} ±0.4	11.63^{c} ±0.4	5.53^{b} ±0.22	1.7 ±0.21	0.00 ±0.00	57.80^{b} ±1.7	1.3 ±0.15	38.40^{abc} ±1.95
24	9.58^{b} ±0.37	8.70^{b} ±0.35	6.94^{cde} ±0.18	1.3 ±0.26	0.00 ±0.00	57.60^{b} ±1.25	1 ±0.3	40.10^{bc} ±1.31
11	9.64^{b} ±0.24	8.69^{b} ±0.3	7.87^{ef} ±0.62	1.2 ±0.24	0.00 ±0.00	61.90^{b} ±0.78	1.3 ±0.3	35.50^{ab} ±0.87
14	7.51^{a} ±0.76	6.64^{a} ±0.71	7.44^{de} ±0.17	0.9 ±0.01	0.01 ±0.01	56.40^{ab} ±1.19	1.5 ±0.42	42.10^{c} ±2.97
21	11.38^{c} ±0.84	10.00^{b} ±0.81	6.39^{bc} ±0.07	1.5 ±0.3	0.00 ±0.00	63.00^{ab} ±1.97	1.6 ±0.42	33.90^{a} ±1.95
Total	10.33 +0.25	9.19 ±0.23	6.37 ±0.18	1.25 ±0.08	0.00 ±0.00	58.09 ±0.68	1.52 ±0.09	38.97 ±0.75

Note: Similar superscripts with in the column do not differ significantly

value of TLC was found to be 6.37± 0.18 thousand/mm^3. Average leucocyte count varied from 2.69±0.09 to 8.43±0.07 thousand/mm^3. The analysis of variance (Table 2) showed significant difference (P<0.01) between bulls for TLC. The mean value of TLC observed in the present investigation were close to those reported by Ram (1979) for Bhadawari calves (6.85 thousand per mm^3 of blood), Sharma *et al*. (1985) for Murrah adult bulls (6.53±0.18) thousand per mm^3 of blood) and Haque *et al.* (2013) for Murrah buffaloes.

Mean percentage of neutrophils, lymphocytes, monocytes, basophils and eosinophils in the blood of Bhadawari bulls are given in Table 1. The overall neutrophils were 38.97±0.75 per cent of leucocytes (range 33.02±0.79 to 49.20±2.99 per cent). Overall values of lymphocyte as per cent of leucocytes were 58.09±0.68 and varied from 47.70±2.99 to 63.70±0.90 per cent. Monocytes were 1.52±0.09 per cent of leucocytes (range 1.00±0.30 to 1.90±0.35). Basophils were 0.01 per cent of leucocyes. Eosinophils were 1.20±0.80 per cent of leucocyte (range 0.90 to 1.70 per cent). The analysis of variance (Table 2) showed significant differences (P<0.01) between bulls for lymphocytes and neutrophils. All the values of neutrophils, lymphocytes, monocytes, basophils and eosinphils were

Table 2: Analysis of Variance for the effect of bull on haematological parameters

Sources of Variation	d.f.	M.S.S							
		Hb	TEC	TLC	Eosino phils	Baso phils	Lympho cytes	Mono cytes	Neutro Phils
Between Bulls	9	46.69**	36.62 **	25495445.14**	6.25^{NS}	0.59^{NS}	64.33*	8.50^{NS}	82.48**
Within bulls	10	2.53	2.41	1061575.7	6.19	0.66	29.82	7.86	14.13

NS- Non significant; *Significant at (P<0.05); ** Highly significant at (P<0.01); MSS (Mean sum of square), df (degree of freedom)

in normal range for buffaloes. These results are in normal range for buffaloes. Present results were comparable with the findings of DLC for Murrah adult bulls reported by Sharma *et al.* (1985), Farooq *et al.* (2017) in Cholistani cattle and Masood *et al.* (2016) in Nili Ravi buffalo bulls.

In this study, mean values of all the haematological attributes were found in normal limits in the blood of young Bhadawari bulls at stage of semen production. This indicates that all the bulls included in the present investigation were healthy. It was concluded the selection of a particular young bull may, therefore be practiced keeping in view the haematological attributes.

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