The Indian Journal of Veterinary Sciences & Biotechnology ***(2018) Volume 13, Issue 4, 68-71***

ISSN (Print) : 2394-0247 : ISSN (Print and online) : 2395-1176, abbreviated as IJVSBT

10.21887/ijvsbt.v13i4.11562

Submitted : 20-11-2017 ***Accepted : 25-12-2017*** ***Published : 08-04-2018***

Hematological Profile of Malnadgidda Breed of Cattle in Karnataka

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Abstract

In the present study a total 107 apparently healthy Malnadgidda animals belonging to individual farmers across eleven talukas of Uttara Kannada district were included. Animals were grouped into male and female, 0-3, 3-6, 6-9 and 9-12 years of age and based on the geographic regions into upper Ghat and lower Ghat/Coastal region of Uttara Kannada district. Blood samples with anticoagulants were collected from these animals and haematological parameters TEC, TLC, Hb, PCV, MCV, MCH, MCHC and PLT were determined. The average value of $7.55\pm0.18x10^6$, $12.72\pm0.41x10^3$, 8.05±0.17, 31.91±0.69, 45.97±3.00, 10.66±1.17, 26.79±1.91and $221.8\pm10.12x10^3$ were observed for TEC, TLC, Hb, PCV, MCV, MCH,MCHC and PLT respectively. Significantly higher TLC values was observed in the Malnadgidda as compared to Deoni and but did not differ significantly with Khillar and Krishnavalley breed. The established haematological values in present study could be used as reference values in Malandgidda breed .

Key words: Haematology Malnadgidda breed, Karnataka.

Introduction

In the recent past, preservation and conservation of the local germplasm has gained priority and attempts are being made to improve the indigenous cattle breeds to improve their production potential. Among the local cattle breeds Malnadgidda is a unique cattle breed with home tract of malnad region of Karnataka. This breed is mainly distributed in the districts of Uttara Kannada, Udupi, Mangaluru, parts of Shivamogga, and Belagavi. The breed is known for its innate resistance against many diseases.

The importance of haemato-biochemical indices in animal husbandry is well acknowledged in cattle (Radostits, *et al*., 2003).The haematological study would provide valuable information about the general health of an animal and therefore can be used for evaluating the health status of the animal and clinical interpretation of laboratory data and hence is a prerequisite for diagnosis of several patho physiological and infectious disorders in cattle (Opera, *et al*., 2006, Kaneko, *et al*, 1997). Deviation of certain blood parameters from their normal limits could be a guide for diagnosis or differential diagnosis of a disease condition (Omer, *et al*., 2010). There is paucity of information in the literature regarding the haematological values of Malnadgidda breed of cattle of Karnataka. Keeping these points in view, the present study was undertaken with the objective of determining the reference values for haematological parameters for Malnadgidda breed of cattle.

Materials and Methods

The study was undertaken in all the eleven talukas of Uttara kannada district of Karnataka. A total 107 apparently healthy Malnadgidda animals belonging to individual farmers across eleven talukas of Uttara Kannada district were used in the study. The animals were grouped into male, female, different age groups 0-3, 3-6, 6-9 and 9-12 years of age and based on the geographic regions into upper Ghat and lower Ghat /coastal region of Uttara Kannada district.

About 10 ml of blood sample was collected aseptically from jugular vein of these animals in sterile vacutainer tubes containing EDTA and were immediately transported to the laboratory on ice. Guidelines laid down by the International Animal Ethics Committee (IAEC) and prevailing local laws and regulations were followed during blood collection.

Haematological parameters viz., Total Erythrocyte Count (TEC), Total Leukocyte Count (TLC), Haemoglobin (Hb), Packed Cell Volume (PCV), Mean Corpuscular Volume (MCV), Mean Corpuscular Haemoglobin (MCH) Mean Corpuscular Haemoglobin Concentration (MCHC) and Platelet Count (PLT) were determined using ERMA PCE -210 (N) Haematology analyser (Erma Inc, Tokyo) following the instructions of the manufacturer.

Statistical analysis: Results were tabulated and analysed by using students 't' test and analysis of variance (Snedecor & Cochran, 1968).

Results and discussion

The results of the present study on haematology is presented in tables 1 to 3.

Table-1.Mean ± SE of haematological parameters of the study population, male and female groups

Sl No	Parameters	Units	Study Population (N=107)	Male (N=18)	Female (N=89)
1	TEC	10^6	7.55±0.18	7.883 ± 0.39	7.489 ± 0.19
2	TLC	10^3	12.72±0.41	12.89 ± 1.26	12.69 ± 0.42
3	Hb	G/DL	8.05±0.17	7.66 ± 0.32	8.12 ± 0.18
4	PCV/HCT	%	31.91±0.69	30.83 ± 1.42	32.13 ± 0.78
5	MCV	FL	45.97±3.00	39.33 ± 1.25	47.28 ± 3.57
6	MCH	PG	10.66±1.17	9.73 ± 1.85	10.85 ± 1.35
7	MCHC	G/DL	26.79±1.91	24.91 ± 0.23	27.16 ± 2.28
8	PLT	10^3	221.8±10.12	242.0 ± 27.88	217.8 ± 10.82

In the study population, significantly higher TLC values was observed as compared to Deoni whereas the same did not differ significantly with Khillar and Krishnavalley breed (Sripad, *et al.*, 2013, 2014 and 2018).

Mean Hb, MCH and PLT values of Malnadgidda cattle breed observed in this study were significantly lower as compared to the mean Hb, MCH and PLT values of Deoni and Khillar, whereas on comparison with the Krishnavalley breed only Mean Hb and MCH values were significantly lower and not PLT values (Sripad, *et al.*, 2013, 2014 and 2018). Other haematological parameters such as mean RBC, PCV, MCV and MCHC values of Malnadgidda breed of cattle did not differ significantly with mean values of Deoni, Krishnavalley and Khillar breeds of cattle.

The variation in the mean haematological values (TLC, Hb, MCH, PLT,) between the breeds could be attributed to the variation of the factors such as age, breed, stage of growth, sex/gender, weather, season, stress, physical exercise of the animal and physiological, reproduction and lactation status

of the animal (Kaneko, *et al.,* 1997).

As regards to the sex, there was no statistically significant difference between mean haematological values of male and female groups of Malnadgidda cattle. Perusal of the data presented in table 1 reveals that numerically TEC and TLC values are low in females as compared to males however there is no significant difference. Other parameters Hb, PCV, MCV, MCH MCHC and PLT are numerically higher in females than male. Further MCV, MCH and MCHC are similar to the previous reports of Gowda *et al*. (2017) whereas TEC and Hb values are lower and TLC value is higher than the reports of Gowda *et al*. (2017) in Malandgidda cattle which may be seasonal effect. It was observed that there were no statistically significant difference between the mean haematological values of male Malnadgidda cattle with respective groups of Deoni, Krishnavalley and Khillar breeds (Sripad, *et al*, 2014 and Sripad, *et al*, 2018). At the same time Hb and MCH levels in female group were lower in Malnadgidda breed when compared to Deoni as observed by Sripad, *et al.* (2018).

The variation in the mean Hb and mean MCH values of female Malnadgidda and Deoni breeds, could be due to the variation in the breed and also the geographical location / habitat from where the breeds originate.

Table-2. Mean± SE of haematological parameters in different age groups of Malnadgidda cattle breed.

Parameter	Units	0-3 yrs (N=44)	3-6yrs (N=28)	6-9yrs (N=22)	9-12yrs (N=13)
TEC	10^6	7.77±031	732±0.41	11.93±0.49	11.05±0.50
TLC	10^3	13.11±0.76	12.14±0.71	7.55±0.26	7.12±0.47
HB	G/DL	7.49±0.25	8.15±0.32	8.70±0.29	7.86±0.46
PCV	%	29.8±1.00	32.79±1.34	33.58±1.31	30.64±1.91
MCV	FL	47.69±8.79	45.58±1.32	45.70±1.00	43.46±1.95
MCH	PG	9.64±0.92	11.33±4.18	11.52±1.03	11.04±0.49
MCHC	G/DL	24.94 ±0.14	32.64±0.77	24.35± 0.65	25.67±0.42
PLT	10^3	217.7±18.06	214.6±20.64	232.1±18.5	227.5±26.56

Comparison of the haematological parameters in Table 2, revealed a statistically significant difference only with respect to Hb between 0-3 years and 6-9 years age groups., whereas in all other parameters, there were no statistically significant difference between different age groups of Malnadgidda breed of cattle. However Gowda *et al.* (2017) reported significant difference between

Table-3. Mean± SE of haematological parameters in Coastal and upper Ghat regions of MalnadGidda cattle breed

Parameters	Units	Coastal (N=45)	Upper Ghat (N=62)
TEC	10^6	7.41 ± 0.23	7.76 ± 0.28
TLC	10^3	12.96 ± .68	12.55 ± 0.51
Hb	G/DL	8.12 ± 0.24	8.00 ± 0.23
PCV	%	33.33 ± 1.02	30.92 ± 0.93
MCV	FL	50.82 ± 7.17	42.56 ± 0.75
MCH	PG	10.95 ± 1.61	10.31 ± 1.97
MCHC	G/DL	29.01 ± 4.61	25.24 ± 0.28
PLT	10^3	235.4 ± 15.82	212.3 ± 13.14

age group 1-3 year and 4-5 years in respect of TEC, TLC, Hb, PCV and MCV.

The variation in the mean Hb values between different age groups of Malnadgidda breeds could be due to the difference in the age group of the animals, as age is one of the factors contributing to the variation in the haematological values as reported by Mahima *et al.* (2013).

Data presented in table 3 reveals that there was no statistically significant difference between mean haematological values of upper Ghat and coastal / lower Ghat regions in the Malnadgidda breed.

In conclusion, the haematological values reported in the present study could serve as the reference value/baseline data for Malnadgidda breed of cattle in general and male, female, different age groups and different geographic regions of Malnadgidda breed of animals.

Acknowledgement

Authors are grateful to Institute of Animal Health and Veterinary Biologicals, Bangalore for funded the research project.

Conflict of Interest: All authors declare no conflict of interest.

References:

Gowda,Hemanth, K., Narayanaswamy, M., Veena, T., Krishnamurthy, A., Nagaraja, C.S., Sridhar, N.B., Ganesh, K. And Kalmath, G.P. (2017) Hematological studies on MalnadGidda breed of cattle in Karnataka. Indian.J.Vet.Sci.Biotech 13(2). 7-11.

Kaneko,J.J.,Harvey, J.W. and Bruss, M.L.(1997) Clinical biochemistry of domestic animals 5thEdn. Academic press. New York. pp.932.

Mahima, Krishna, V.S., Amit, K.V., Vinod, K., Shankar, K.S. and Debashis,R. (2013) Hematological and serum biochemical profile of apparently healthy Hariana cattle heirfers in Northern India. Pak J. Biol. Sci,16. 1423-1425.

Omer,S.A.,Salawa,M.E.,Khogali,H.,Agab.,Gussey. and Samad,H.A. (2010) Studies on some biochemical and haematological indices of Sudanese camels (Camelus dromedaries) Published in Sudan University of Science and Technology Bulletin p1-7

Opera, M.N., Ike, K.A. and Okoli, I.C. (2006) Hematology and plasma biochemistry of the wild adult African Grasscutter.J.Am.Sei., 2:17-22

Radostits,O.M., Gay C.C.,Blood, D.C. and Hinchcliff, K.W.(2003) Veterinary Medicine, Elsiever Science Ltd., USA. 9th Edn.p148

Snedecor, G.W. and Cochran,W.G. (1968) Statistsical Methods, 5thedn, Publ.Oxford and and IBH publishing Co., Mumbai, India. pp.361-362.

Sripad,K., Shrikant Kowalli and Raju Metri. (2013) Hematological and Serum Biochemical profile of apparently healthy Krishnavalley Breed of cattle in Karnataka. Asian. J. Ani. Res. 1(3). 40-41.

Sripad,K., Shrikant Kowalli and Raju Metri. (2014) Hematological profile of Khillar breed of cattle in Karnataka. Vet. World. 7(5). 311-314.

Sripad,K., Ganesh Hegde, Giridhara, P. and Byregowda, S.M. (2018) Hematological and serum biochemical reference values for Deoni breed of cattle in Karnataka.Int.J.Phar.Bio.Sci. 9(1)(B). 175-180.

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