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RESEARCH ARTICLE

HAEMATOLOGICAL PARAMETER OF SHEEP IN NORTH EASTERN DISTRICTS OF TAMIL NADU

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ABSTRACT

The study was carried out in five North Eastern districts of Tamil Nadu (Kanchipuram, Thiruvallur, Vellore, Thiruvannamalai and Villupuram) five blocks were randomly selected from each districts. Ten apparently healthy female sheep aged below one year were randomly selected from a block. Approximately 8 ml of blood was collected from each sheep by jugular venepuncture. Predominantly two breed was observed such as Madras Red and Ramnad white in the study area. The blood samples were collected in EDTA vaccutainer for haematology and transported to the laboratory by using ice box. The samples were estimated by using auto Haematology analyser (Mindray BC- 2800 Vet). The hematological parameters viz., Packed Cell Volume (PCV), Hemoglobin (Hb), Red Blood Cell (RBC count), platelet count, Mean corpuscular volume (MCV) and Mean corpuscular hemoglobin concentration (MCHC), of sheep were found significantly ($P \leq 0.01$) different between the districts. However the values were within the normal range.

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INTRODUCTION

Small ruminants such as sheep and goats play important role in the livestock subsector in Tamil Nadu. The two breeds of sheep predominant in northern districts. Blood is an important index of physiological and pathological changes in an animals. The primary function of the blood is to transport oxygen from respiratory organs to body cells (Duke, 1975) distributing nutrients and enzymes to cells and carrying away waste products thereby maintaining homeostasis of the internal environment The various functions of the blood are carried out by the individual and collective actions of its constituents – the haematological and biochemical components. Haematological tests have been widely used for the diagnosis of various diseases and nutritional status of animal. The information gained from the blood parameters would substantiate the physical examination and together with medical history provide excellent basis for medical judgment. In addition, it would help determine the extent of tissue and organ damage, the response of defence mechanism of the patient and aid in the diagnosing the type of possible anaemia.

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A quantifiable variation was reported in blood parameters due to altitude, management, feeding level, age, sex, breed, health status, method of blood collection, haematological techniques used, diurnal and seasonal variation, ambient temperature and physiological status (excrement, muscular exercise, pregnancy, estrus, parturition, time of sampling, water balance and transportation. Physiologic and pathological changes can be best evaluated when normal blood values are available for comparison. Even though considerable information is available on the normal blood parameters of domestic animals, the values are that of exotic breeds kept under different environment and management conditions. This study was therefore an attempt to come up with normal haematological and biochemical reference values in indigenous sheep breeds found in the semiarid zones of Nigeria raised under free ranged systems influenced by breed, sex and age. The present study was undertaken to evaluate the haematological indices in sheep on natural grazing land in northern Tamil Nadu.

MATERIALS AND METHODS

Five districts of North Eastern Agro Climatic Zone of Tamil Nadu viz. Kanchipuram, Thiruvallur, Thiruvannamalai, Vellore and Villupuram were selected for this study. Blood sample were collected from two fifty animals in study districts

by jugular venepuncture in EDTA tube and it was preserved in ice box during transport. The Hemogloblin (Hb), Packed Cell Volume (PCV), Red Blood Cell (RBC), White Blood Cell (WBC) and platelets counts were estimated by using auto Haematology analyser *(Mindray BC- 2800 Vet)*. The MCH, MCHC and MCV were calculated using other haematological parameter.

Statistical analysis

The data obtained from the above studies were analysed by standard statistical methods described by Snedecor and Cochran (1989) such as one way analysis of variance and correlation coefficient and the results were interpreted and discussed.

Table. Haematological parameter of sheep in Kanchipuram (KPM), Thiruvallur (TVL), Thiruvannamalai (TVM), Vellore (VLR) and Villupuram (VPM) districts of Tamil Nadu (Mean ± S.E)

Haematology values	Reference range	Mean ± S.E					F value	P value
		KPM(n=90)	TVL (n=40)	TVM(n=40)	VLR (n=40)	VPM (n=40)		
PCV(%)	26-45	32.37^{c} ±0.69	32.19^{c} ±0.68	29.90^{b}±0.69	26.47^{a} ±0.66	27.22^{a} ±0.76	19.09**	0.00
Hb (g/dL)	8-12	8.30^{abc} ±0.11	8.56^{c} ±0.12	8.38^{bc} ±0.07	8.10^{a} ±0.08	8.16^{ab} ±0.06	5.86**	0.00
RBC ($\times10^{6}/\mu L$)	5-8	5.68^{bc} ±0.12	5.27^{a} ±0.15	5.78^{cd} ±0.11	5.38^{ab} ±0.12	5.38^{ab} ±0.11	7.17**	0.00
MCV (fL)	40-60	58.15^{b} ±1.88	63.64^{c} ±2.61	52.74^{a} ±1.81	50.47^{a} ±1.94	51.25^{a} ±1.59	7.15**	0.00
MCH (pg)	11-17	14.88^{a} ±0.36	16.88^{b} ±0.60	14.74^{a} ±0.35	15.31^{a} ±0.34	15.43^{a} ±0.33	5.18**	0.00
MCHC (g/dL)	25-35	26.20^{a} ±0.75	27.07^{ab} ±0.69	28.60^{b} ±0.69	31.34^{c} ±0.83	30.87^{c} ±0.86	10.13**	0.00
WBC($\times10^{3}/\mu L$)	4-12	7.83^{d} ±0.08	7.44^{c} ±0.11	7.67^{cd} ±0.07	5.98^{a}±0.14	6.75^{b} ±0.13	47.01**	0.00
PLATELET($\times10^{5}/\mu L$)	2.5-7.5	3.66^{b} ±0.13	3.67^{b} ±0.14	3.28^{a} ±0.09	3.27^{a} ±0.09	3.39^{ab} ±0.10	2.90*	0.01

^{abc} the mean values bearings different superscripts vary significantly P*(P ≤ 0.05) and P**(P≤ 0.01).

Fig. 1. Blood collection from jugular vein

Fig. 2. Hematological analyser

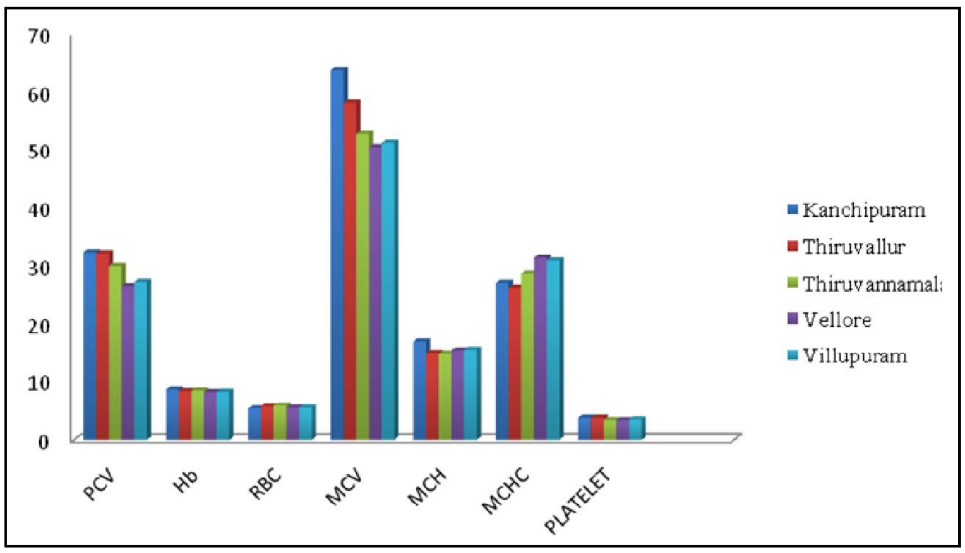

Fig. 3. Mean value of Hematological parameter in different districts

RESULTS AND DISCUSSION

The hematological parameters *viz.,* Packed Cell Volume (PCV), Hemoglobin (Hb), Red Blood Cell (RBC count), platelet count, Mean corpuscular volume (MCV) and Mean corpuscular hemoglobin concentration (MCHC), of sheep were found significantly ($P \leq 0.01$) different between the districts. However the values were within the normal range. The hematological parameter of the sheep *viz.,* RBC, Hb, PCV, platelets and liver enzymes (ALT, AST, GGT and SAP) were significantly varied between the districts. Variation in the hematobiochemical parameter depends on many factors like nutrition, age and sex. A significant variation was observed on Hb and MCV among sheep breeds reared in the Adamawa state of Nigeria (Addas *et al.,* 2010). Age was reported to be an important factor even the month can influence the blood hematological values (Egbe *et al.,* 2000), Transportation time may influence the hematological values (Bornez *et al.,* 2009), and the concurrent disease conditions even at sub clinical level could alter the hematological parameter (Addas *et al.,* 2010). Egbe *et al.* (2000) reported a high RBC values in the young ruminants due to excitement or strenuous exercise during handling resulting in release of adrenaline and associated spleen contraction causing release of more RBC into circulation. The haematological parameter study between group of animals reared in organized and unorganized animals present in the northern districts of Uttar Pradesh revealed a significant variation in haematological indices between the districts (Sharma *et al.,* 2006).

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