OBSERVATIONS CONCERNING HAEMATOLOGICAL PROFILE IN GOAT

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Abstract

This study had analysed the hematological profile of goats (adult and youg females and males) and the influence of sex on the hematological values whith MS4/5 Hematological Anlyser (Melet Schloesing, France). On the red blood cell (RBC) counts of goats, sex had any influence. The hemoglobin (Hb) and hematocrit (Ht) values were smaller in both sexes (8.18±0.27 in females and 8,2±0,17 in males) as well as the packed cell volume (PCV) values (14,37±0,36 in females and 15,5±1,6 in males). Mean of the hemoglobin concentration (MCHC) was higher in the female than male goats (43,65±1,01 in male and 44,09±1,21 in female). Leukocytes mean was high in both sexes, which may be interpreted as a potential infection. Lymphocytes represented more than 50% of the total white blood cell (WBC) counts in male and females goats. Monocyte and basophile mean was not influenced by sex. But, in the case of eosinophil average, the males had smaller values than females and both were smaller than normal. Mean of neutrophils was lower than normal. The haematologic profile on the youg goats of 3 month age, male and female, was the lower values with 8-10 % in comparison with the adult goats and bucks. Since the animals are apparently healthy, any value may be regarded as possible infection or metabolic and nutritional disorder.

Key words: goat, hematological profile, hemoglobin, eritrocyte, leukocyte.

INTRODUCTION

Despite the social and economic values of goats as source of meat, milk and hides, with a great production potential, the research effected on goats in our country were neglected for long time.The goats revaluation depends on various factors, including the great prevalence of diseases, poor management practices and extensive production systems .The diseases action is the most aggressive on animals.From this point view, clinic and paraclinic exams are essential to sanitary strategies (control, prevention or treatment).

The hematological tests served as information base for animal health assistance. It has been reported that regardless of age, sex and climate, goats reared under traditional husbandry system have low hematological values compared to those reared under modern husbandry (Coles, 1980; Schalm *et al,* 1975). Low nutritional grassland pasture, stress, parturition and climatic factors greatly alter the blood values of goats (Anosa and Isoun, 1978, Radostits *et al* 1994).

Blood is an important and reliable medium for assessing the health status of individual animals (Oduye, 1976). Much work has not been done on hematological profiles of goats. Therefore, this paper focused on the hematological values of apparently healthy goats as influenced by sex in The Department of Reproduction and Biotechnologies from The Research and Developmental Institute for Sheep and Goat Palas Constanta,

The RBC, Hb, PCV, MCV, MCHC and WBC values obtained in this study in both sexes in goats were comparable to those previosly reported (Sarror and Schil, 1977; Anosa and Todd et al, 1952);

MATERIALS AND METHODS

The goats used in this study were kept in The Department of Reproduction and Biotechnologies bio-base. The animals were apparently healthy. The study was made on

14 goats , divided by sex (14 females and 4 males). Two ml of blood was collected from each animal from the external jugular vein following proper restraint by the attendants and with minimal excitement. The blood were collected in ethylenediamine tetracetate (EDTA) vacutainer tubes and transported to the laboratory for analysis. The samples were analyzed within two hours from collection with the hematological analyzer MS 4-5 Meled Schloesing,Germany.

The red blood cell (RBC), white blood cell (WBC), packed cell volume (PCV), hemoglobin concentration (Hb), differential leukocyte counts (DLC) mean corpuscular volume (MCV) and mean corpuscular hemoglobin concentration (MCHC) were determined as described by Schaim et al (1975). All of them were statisticcally processed with the purpose of constituting the hematological profile. It is know that goats and the sheep have smallest erythrocytes as volume, but in highest number 14-15 mil/mm)

The statistical analysis was carried out using statistical Student test.

RESULTS

The hematological (mean ± Se) profiles of the goats are presented in tables 1 to 6. The RBC mean on female was, 13.06±0.45 and 12,57±0,28. The coefficients of variance permits the use of mean as statistic interpretation.This means are closed to the normal mean of RBC 14-15 mil/mm (Table 1 and 2).

Table1
Erythocyte paramters (mean ± S.e.) of female goats

Female	Statistics							
	N	Mean	Sd (yEr±)	Se (yEr±)	Min	Max	Median	CV
RBC (m/mm)	14	13.06	1.72	0.46	9.11	15.8	13.37	13%
MCV	14	14.38	1.37	0.36	12.6	18.3	14.35	9%
HCT (%)	14	18.78	3.309	0.88	12.4	23.8	20.05	18%
MCH (pg)	14	6.23	0.34	0.09	5.7	6.7	6.25	5%
MCHC (g/dl)	14	44.09	4.55	1.22	35.7	53.9	43.85	10%

Table 2
Erythrocyte parameters (mean ± S.e.) of male goats

Statistics	Male				
	RBC (m/mm)	MCV	HCT (%)	MCH (pg)	MCHC (g/dl)
N	4	4	4	4	4
Mean	12.57	15.5	19.55	6.5	43.65
Sd(yEr±)	0.5658	3.23316	4.90748	0	9.17987
Se(yEr±)	0.2829	1.61658	2.45374	0	4.58993
Min	12.08	12.7	15.3	6.5	35.7
Max	13.06	18.3	23.8	6.5	51.6
Median	12.57	15.5	19.55	6.5	43.65
CV	5%	21%	25%	0%	21%

In both, males and females the coefficient of variance is less than 30% which revealed that the mean of erytrocytes and erytrocitar constants are representative for this category of goats. The erythrocyte parameters HCT, MCH and MCHC were analyzed in both sexes. HCT mean was 18,77 ±0,88% in females and 19,55±2,45 % in males. MCH

had the following values: 6,22±0,08 in females and 6,5±0 pg in males. MCHC was 44,09±1,21 in females compared with 43,65±1,01 in males.

Coefficient of variance did not exceed the limit of 35%, which can by used in statistically interpretation. Except MCHC, HCT and MCH were higher in males than females.

The mean of hemoglobin concentration was lower than normal : 8,18 ±0,27 g/100 ml in females with a minimum of 5,5 and a maximum of 9,3 and 8,2±0,17 in males with a minimum of 7,9 and a maximumof 8,5.

These parameters translated to a potential presence of anemic disease which can explaine the biological reduction of the hemoglobin. The hemoglobin mean is smaller than the normal values 10-15 g/100ml. In corroboration, the hemoglobin with the hematocrit can establish the anemic status of animal (table 3 and 4)

Table 3
The hematocrit and hemoglobin means in female goats

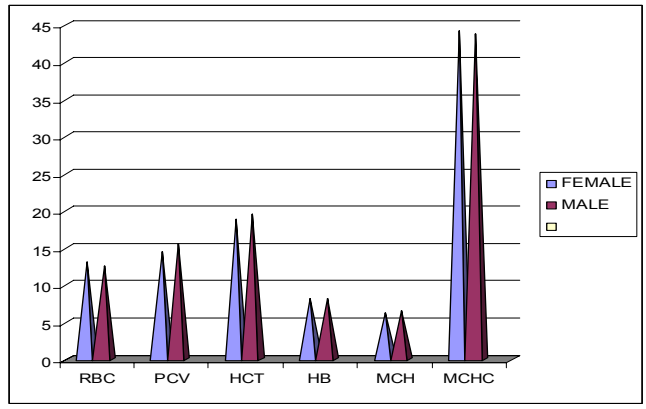
Statistics	Female	
	HCT (%)	Hb (g/dl)
N	14	14
Mean	18.78	8.19
Sd(yEr±)	3.31	1.01
Se(yEr±)	0.88	0.27
Min	12.4	5.5
Max	23.8	9.3
Median	20.05	8.55
CV	18%	12%

Table 4
The hematocrit and hemoglobin means in male goats

Statistics	Male	
	HCT (%)	Hb (g/dl)
N	4	4
Mean	19.55	8.2
Sd(yEr±)	4.9	0.35
Se(yEr±)	2.45	0.17
Min	15.3	7.9
Max	23.8	8.5
Median	19.55	8.2
CV	25%	4%

The RBC values in the ruminants in this study may, among other things, be due to excitement or strenuous exercise during handling (Gartner et al., 1969). This leads to the release of adrenaline and hence spleen contracts and this causes the release of more RBC into circulation.The MCV and MCHC values in both sexes fluctuated and their values are dependent upon RBC, Hb and PCV values.

Figure 1 .Representation of erythrocytic parameters in male and female goat



The fluctuation of this values are represented in figure 1., where we observed the differences between females and males.

The total WBS mean in males and females is between 15,41± 1,43 with a minimum of 10,21 and a maximum of23,75 and 12,77±1,47 with a minimum of 10,21 and a maximum of 15,33, respectively. Both categories of goats had higher values than normal (5-14 mil/mm) and can be attributed to immune response to different environmental factors and physiological status (table 5-6).

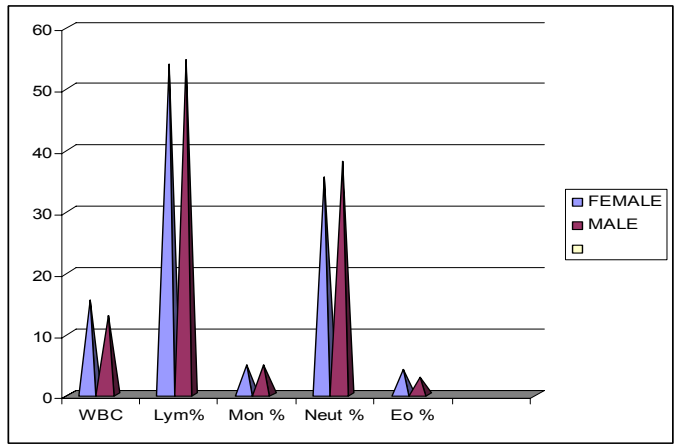
Table 5
Leucocyte values (mean ± S.E.) of female goats

Females	Statistics							
	N	Mean	Sd(yEr±)	Se(yEr±)	Min	Max	Median	CV
WBC (m/mm)	14	15.41	4.52	1.21	10.21	23.75	14.89	29%
Lym(%)	14	54.54	5.36	1.431	49.3	69.4	52.2	10%
Mon(%)	14	4.83	0.76	0.20	3.6	6.4	4.9	16%
NEU(%)	14	35.5	4.93	1.32	22.6	41.8	35.7	14%
EO(%)	14	4.16	2.54	0.68	0	8.8	3.35	61%
BA(%)	14	0.47	0.27	0.07	0.1	1	0.45	57%

Table 6
Leucocyte values (mean ± S.E.) of male goats

Statistics	male					
	WBC (m/mm)	Lym (%)	Mon (%)	NEU (%)	EO (%)	BA (%)
N	4	4	4	4	4	4
Mean	12.77	53.8	4.85	38.1	2.85	0.4
Sd(yEr±)	2.96	2.65	0.29	2.42	0.40	0.12
Se(yEr±)	1.48	1.33	0.14	1.21	0.20	0.06
Min	10.21	51.5	4.6	36	2.5	0.3
Max	15.33	56.1	5.1	40.2	3.2	0.5
Median	12.77	53.8	4.85	38.1	2.85	0.4
CV	23%	5%	6%	6%	14%	29%

Figure 2. Representation of leucocytar parameters in male and female goats



In leukocytary series, the mean of lymphocytes was 54,53 ±1,43% in female and 53,8±1,32%in males, respecting the normal rapport between 50-55%. The monocytes are in the same normal limit (3-5%) and their means are 4,82± 0,20% for females and 4,85±0,28 %in male. Neutrophils average was smaller than normal (40-45%) as follows: 35,5±1,31% in females and 38,1±1,21% in males. The 4,16±0,68% value of eosinophils in females indicated a potential helmintic or infectious aggression compared with the males value 2,85±0,20% (figure 2).This fact can be explained by the isolation of females that graze on the field, from the males which remain in the stable.

The white blood cells (WBC) are the soldiers of the body and their high counts may also be due to the increase of the complement in the immune systems o the animals. It may also be attributed to physiological phenomena i.e. excitement or strenuous exercise during handling.

Table 7
Hematological values (mean ± S.E.) young female goat

Young female	Statistics							
	N	Mean	Sd(yEr±)	Se(yEr±)	Min	Max	Median	CV
WBC (m/mm)	14	15.41	4.52	1.21	10.21	23.75	14.89	29%
Lym(%)	14	54.54	5.36	1.431	49.3	69.4	52.2	10%
Mon(%)	14	4.83	0.76	0.20	3.6	6.4	4.9	16%
NEU(%)	14	35.5	4.93	1.32	22.6	41.8	35.7	14%
EO(%)	14	4.16	2.54	0.68	0	8.8	3.35	61%
BA(%)	14	0.47	0.27	0.07	0.1	1	0.45	57%

Table 8
Hematocrit and hemoglobin values (mean ± S.E.) of young female goat

Statistics	Young female kidds	
	HCT (%)	Hb (g/dl)
N	14	14
Mean	18.78	8.19
Sd(yEr±)	3.31	1.01
Se(yEr±)	0.88	0.27
Min	12.4	5.5
Max	23.8	9.3
Median	20.05	8.55
CV	18%	12%

The haematologic profile on the female youg goats of 3 month age (tab .7 and tab. 8), a was the lower values with 8-10 % in comparison with the adult goats and bucks. Since the animals are apparently healthy, any value may be regarded as possible infection or metabolic and nutritional disorder.

CONCLUSIONS

1. The MCV and MCHC values in both sexes fluctuated and their values are dependent upon RBC, Hb and PCV values. Hemoglobin has low level, indicating an anemic status of female and male goats.
2.The total WBC mean had very high values in both sexes and can be attributed to the immune response to different factors.
3. The high lymphocyte counts in the animals in this study might be attributed to stress and immune response to the environment which harbours various detectable and undetectable parasitic and/or bacterial organisms. The eosinophil values can translate to an infection or helmintic aggression.
4. Since the animals are apparently healthy, any value beyond the upper limit in one or both sexes may be regarded as leucocytosis and any value below the lower limit may be termed leucopaenia.
5. Sex showed relatively influence on the haematological values of the goat studied , existing fluctuations in all the hematological parameters of both sexes
6. What caused the fluctuation in various parameters may be undetected minor infections, weather extremities and poor management

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