OBSERVATIONS REGARDING SOME ENVIRONMENT FACTORS ON HEMOLEUCOGRAMA IN LACTATION OVINES

M. Condrea

University of Agricultural Sciences and Veterinary Medicine
„Ion Ionescu de la Brad" Iasi, Romania
e-mail: mcondrea22@yahoo.com

Abstract

A study was made on a lot of Merinos de Palas sheep, with the same age (second lactation) and the same milk production.

Some hematologic marks were investigated during winter season (February) and summer season (June). The results show a decrease in the average values of the erythrocytes number ($9.9x10^6/mm^3$), hemoglobin 10.9g/dl) and hematocrit (3.,2%) during the winter season as compared to the summer season ($1.7x10^6/mm^3$; 11.2g/dl; 36.8%). These variations do not exceed the physiologic limits of the species. In the leukocytes series there is an increase in the average values of the leukocytes number during wintre season ($9.9x10^3/mm^3$) as compared to the warm season, but without pathologic significance and a slight increase of limphocytes (63.07%). We can conclude that there is a corelation among alimentation, environment temperature and the value of some hematologic marks.

Key words: Ovines, hemoleucograma, environment factors

MATERIAL AND METHOD

The research was done on Merinos de Palas sheep. Only one lot of 10 sheep was formed, with the same age (second lactation) and the same milk production. The investigations were made in 2 phases. The first determination was made in February, at the beginning of the lactation, when the food was grass (table 1). The second determination was made in June, in the middle of the lactation, with summer food (table 2).

Blood tests were made for this lot on anticoagulant substances (EDTA Na_2), in the morning before the first meal (during the two phases).

The blood samples were used for the following determinations: number of erythrocytes and leukocytes, hemoglobin, hematocrit, leukocytes formulae.

For the determinations we used an automatic veterinary hematologic analyzer, MS 4-5.

The individual data were statistically transformed by counting the average (X) and the standard error of the average (Sx).

Table 1
Diet for a 45 Kilos sheep (winter season)

Forage	Kg	2.33	1.55	175	175	13.1	5.6
		SU (Kg)	**UFL**	**PDIN** (g)	**PDIE** (g)	**Ca** (g)	**P** (g)
Lucerne hay	1.7	1.53	0.9333	160.65	133.11	23.715	3.825
Corn grains	0.62	0.5301	0.667926	43.4682	63.612	0.15903	1.85535
Stock beet	2	0.26	0.299	16.12	22.36	0.65	0.39
Salt	0.003						
TOTAL		2.3201	1.900226	220.2382	219.082	24.52403	6.07035

Table 2
Diet for a 45 Kilos sheep (summer season)

Forage	Kg	1.2-1.8	0.95	89.5	89.5	5.6	3.2
		SU (Kg)	**UFL**	**PDIN** (g)	**PDIE** (g)	**Ca** (g)	**P** (g)
Corn grains	0.35	0.2992	0.377055	24.5385	35.91	0.089775	1.047375
Hill grass land	5	1.9	1.501	171	155.8	20.9	6.65
TOTAL		2.19925	1.878055	195.5385	191.71	20.98978	7.697375

RESULTS AND DISCUSSIONS

The results ragarding the hematologic marks researched during the two seasons are presented in table 3.

As presented in the table, the average values of the erythrocytes series has variations according to the season.

At the first determination (winter season) the average values of the erythrocytes number ($9.9x10^6/mm^3$), hemoglobin (10.9g/dl) and hematocrit (34.2%) are decreased as compared to the ones obtained at the second determination, during the summer season ($10.7x10^6/mm^3$; 11.2g/dl; 36.8%). This decrease in the average values of the erythrone on the lot investigated in February does not go under the inferior limit normal for this species and physiologic category. In the specialty literature the normal values for the erythrocytes series vary between large limits according to the author: e.g. Schalm (3) thinks that the erythrocytes values in the clinically healthy sheep vary between 8.0-16.0(12) $x10^6/mm^3$, hemoglobin between 8-16(12)g/dl and hematocrit between 24-50(38)%; Pârvu Gh.( ) quotes as averages of the three marks in adult sheep, the values of $12.0x10^6/mm^3$; 11g/dl; 36%. According to The Merck Veterinary Manual – 8^{th} edition, the variation limits of the red series in sheep are: $9\text{-}15x10^6/mm^3$, for the number of erythrocytes; 9-15g/dl, for hemoglobin and 27-45% for the hematocrit.

Pârvu Gh. (2) also obtained in his study a decrease in the average values of the erythrocytes series. He reports even a decrease in the marks values to the limit of anemia at the end of winter and beginning of spring, and their recovery during summer – autumn. The higher values of the erythrone during summer season are explained by some researchers (3, 4) probably by the bigger ingestion of plastic and catalytic components (proteins, Co, Fe, Cu, etc.) necessary for erythrogenesis and hemoglobinogenesis. Moreover it can also be about a relative increase of these values as a result of a reduced water and sodium ingestion during summer.

Table 3
Variations of the average values of the hematologic picture in Merinos de Palas sheep during summer and winter

No.	Studied constant	U.M.	First determination (winter season)	Second determination (summer season)
1.	Erythrocytes	$10^6/mm^3$	10.7±0.95	10.7±1.01
2.	Hemoglobin	g/dl	10.9±0.75	11.2±0.97
3.	Hematocrit	%	34.2±0.94	36.8±0.98
4.	Leukocytes	$10^3/mm^3$	9.9±1.05	7.2±0.98
5.	Neutrophils	%	31.01±0.85	31.31±0.84
6.	Eosinophils	%	1.32±0.96	2.18±0.92
7.	Basophils	%	0.3±0.88	0.41±0.97
8.	Lymphocytes	%	63.07±0.81	61.06±0.89
9.	Monocytes	%	4.3±0.90	5.04±0.76

There are researches in the specialty literature which support an increase of the erythrone's values in winter and a decrease of these in summer: Smith and Kilbourne (quoted by Schalm) discover bigger numbers in winter than in summer, $12.0x10^6/mm^3$ respectively $10.0x10^6/mm^3$. Greig and Bayne (quoted by Schalm) discover a significant difference in favour of the high nutritional level in a research regarding the influence of increased nutrition on the number of erythrocytes.

There are also authors (3) who don't speak about differences at the level of phosphoremia, sideremia and haemoglobin at the end of winter and after 2 grazing months.

Brody (quoted by Schalm) studies the influence of the environment temperature on the blood composition and sustains that the water lost through exudation is pretty little and hemodilution installs in the warm environment as a result of the increased water consumption, the consequence being a relative decrease of the erythrocytes series values during this season.

Having regard to the total number of leukocytes we discover in this research that there is a difference between the two lots, respectively a higher value in winter ($9.9x10^3/mm^3$) as compared to the summer season ($7.2x10^3/mm^3$), values which are between the normal limits of variation for the species. In the leukocytes series there is also a decrease in the inferior limit of the eosinophils values in both lots (1.32% and 2.18%) and a slight increase of limphocytes (63.07%) in winter.

The overall analysis of the results shows a slight influence of the nutrition and environment temperatures especially on the erythrocytes picture.

CONCLUSIONS

1. The average values of the erythrocytes number, hemoglobin and hematocrit were slightly lower in the winter determination as compared to the summer season, but without entering the pathologic area.

2. The total number of leukocytes slightly increases during winter season, but without exceeding the normal limits of the species.

3. There is an increase of limphocytes percent in the leukocytes formulae during winter season.

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