

Original Article

Evaluation of Hematological Profile in Dairy Cows, Bălțată Românească Breed

MIREȘAN Vioara¹, Aurelia COROIAN^{1*}, Genel SUR², Camelia RĂDUCU¹,
Antonia ODAGIU³, Luisa ANDRONIE¹, Cristian Ovidiu COROIAN¹

¹Faculty of Animal Science and Biotechnology, University of Agricultural Sciences and Veterinary Medicine, 3-5 Calea Manastur, 400372 Cluj-Napoca, Romania

²University of Medicine and Pharmacy, Iuliu Hațieganu, 8 Victor Babeș St., 400012 Cluj-Napoca, Romania

³Faculty of Agriculture, University of Agricultural Sciences and Veterinary Medicine, 3-5 Calea Manastur, 400372 Cluj-Napoca, Romania

Received 12 November 2015; received and revised form 22 November 2015; accepted 5 December 2015
Available online 31 December 2015

Abstract

Bălțată Românească is a native cattle breed. The lactation determine a significant changes on physico-chemical parameters of milk. These parameters is influenced by haematological profile. It is important to evaluate the hematological profile, as is an assessment of the health of animals. HEM presents the lowest values in lactation 2, 8.32 ± 2.01 (g/dL) and higher lactation 5 10.35 ± 0.96 (g/dl). HCT varies thus: lowest averages are 26.71 ± 1.28 L1 and L5 highest in 29.87 ± 1.07 .

Keywords: haematological profile, lactation, CHEM, HEM, HCT, milk.

1. Introduction

Bălțata românească is an improved native breed that resulted from cattle crossings absorption Sura de Stepă with Simmental. Bălțata Românească breed is recognized as independent in 1959. Performance for milk production differs depending on the source of genetic material, growing conditions and exploitation [17]. Race influences the quantity and quality of milk and other traits such as feed conversion capacity, longevity and precocity [9]. The cattle with a high yield are sensitive to metabolic diseases during the early postpartum period. An expression of the functions of the immune system causes an increased risk of infectious diseases [7].

Moreover, the time of breast-feeding metabolic disorders related to a decrease fertility [2]. Blood values are a representation of the health of animals. Metabolic diseases decreases milk production during lactation [5].

The metabolic profile is often used to indicate various health problems and diseases that can cause some decreases in milk production [6].

The aim of this study was to evaluate the influence of lactation and haematological profile on quantitative and qualitative parameters of milk in Bălțată Românească breed.

2. Material and Method

The biological material studied is performed on Bălțată Românească breed, having in evaluation number 5 heads of each lactating cows. Cows come from a farm in Salaj family.

* Corresponding author.
Fax: +40-264-593792
Tel: +40-264-596384
e-mail: coroian.aurelia@gmail.com

They were selected for the study cows with superior. The parameters analyzed are: fat, protein, lactose, fat content per total and normal lactation; protein content in total and normal lactation. The total quantity of milk per lactation and normal.

Physico-chemical analysis was performed with the device Lactoscan. Blood samples were collected from each cow in EDTA vacutainers.

Five samples were taken from each cow blood. Analysis was performed with haematological parameters Abacus Junior Vet device. Haematological parameters are analyzed: the number of red blood cells (RBC), mean red blood cell hemoglobin concentration-CHEM; HM-hemoglobin; HCT-hematocrit; WBC-lymphocytes; granulocytes, platelets.

3. Results and Discussions

The values for the parameters are showing in the fig, 1, and we can be observed that not appear important difference. The lowest level lactation grease is three, with an average of 3.57%. The highest level is five lactation, 4.17% respectively. Similar acts and lactose. The values obtained in this study fall in average values characteristic of the breed [18].

Fig. 1 illustrates the mean values for fat, protein and lactose according to lactation.

Fig. 2 showed average values for the content of G/TL, NL and contents P/TL, NL. It can be seen that both GTL, NL and P/TL, NL differ. The highest values are in lactation 5.

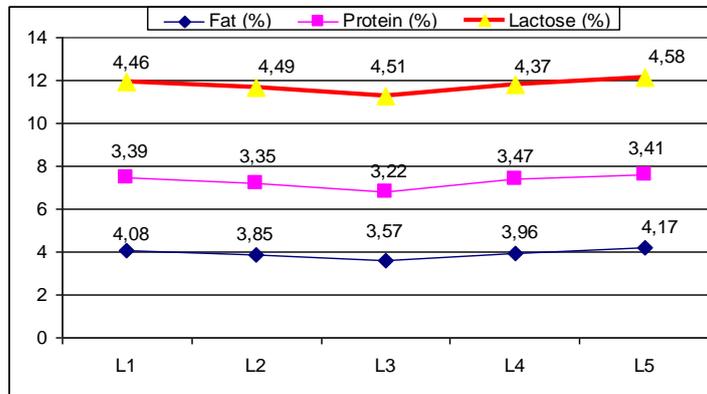


Figure 1. The influence of lactation on fat, protein and lactose in milk to Bălțată Românească breed

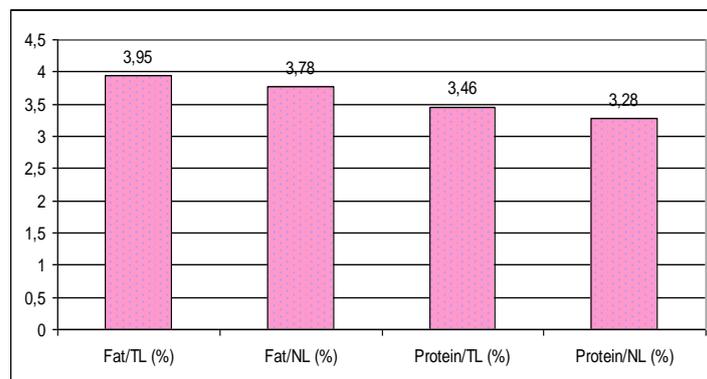


Figure 2. The content of fat and protein per total and normal lactation; P- protein content (%); G- the fat content (%); NL- normal lactation; TL- total lactation

Average production by normal lactation was in average 3000-3200 kg with 3.88% fat and about after this 4000-4300 kg milk, with limits between 3000-5750 kg [17]. The amount of total lactation milk per lactation is higher in studied

animals compared with reported data (Fig. 3) [17, 14-15].

The study helps identify possible hematological parameters in different species nutritional errors [12].

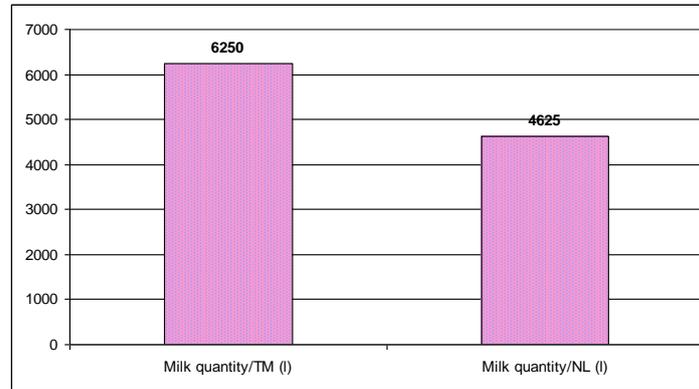


Figure 3. The amount of total and normal lactation milk to Bălțată Românească breed

Blood constants provides useful guidance for metabolic profile in the physiological stages of the animal. Cows and buffaloes for milk, like most mammals nursing are usually in negative energy balance in the first few weeks of lactation [13].

Changing physiological parameters determines an imbalance to the body, decreased milk production and decreasing breeding performance [10-1]. Table 1 illustrates hematological parameters analyzed according to the lactation (L1-L5).

Table 1. Mean values for hematological parameters analyzed according to the lactation in Bălțată românească

Parameter	Lactation				
	1	2	3	4	5
RBC($\times 10^6/\mu\text{L}$)	5.7 \pm 2.15	5.18 \pm 1.33	4.72 \pm 1.87	6.8 \pm 2.37	5.87 \pm 2.10
CHEM (g/dl)	32.3 \pm 1.06	34.7 \pm 1.19	31.8 \pm 1.02	33.5 \pm 1.2	34.1 \pm 1.56
HEM (g/dl)	9.5 \pm 0.7	8.32 \pm 2.01	10.11 \pm 1.66	9.75 \pm 0.85	10.35 \pm 0.96
HCT (%)	26.71 \pm 1.28	28.15 \pm 1.05	29.72 \pm 1.64	27.56 \pm 2.01	29.87 \pm 1.07
WBC ($\times 10^9/\text{L}$)	7.98 \pm 1.68	10.23 \pm 1.26	11.91 \pm 1.52	14.39 \pm 1.84	14.63 \pm 1.17
Lymphocytes ($\times 10^9/\text{L}$)	3.2 \pm 2.09	3.9 \pm 1.65	4.25 \pm 1.44	6.08 \pm 1.66	6.17 \pm 2.03
Granulocytes ($\times 10^9/\text{L}$)	4.75 \pm 1.18	5.39 \pm 2.06	6.17 \pm 1.38	7.03 \pm 2.04	5.66 \pm 1.48
Platelets ($\times 10^3 \mu\text{L}$)	309 \pm 2.11	273 \pm 2.40	312 \pm 1.69	298 \pm 2.17	322 \pm 2.91

RBC - eritrocyte; CHEM - mean erythrocyte hemoglobin concentration; HEM - hemoglobin; HCT - hematocrit; leukocytes - WBC;

The results reported in different studies indicate significant variation for hematological parameters. The average was 4.4 erythrocytes and white blood cell count was 7.8 in research reported by Hasanpour et al. (2008) [4].

HEM, RBC and WBC and cell volume changes according to age, climate, diet and physiological states [3]. The mean values for RBC (a) presented in Fig. 4, and were analyzed by comparing the CHEM (b) blood depending on

lactation. It can be observed the highest average value of 6.8 \pm 2.37 for RBC (g/dL) in lactation 4 and the lowest is 4.72 \pm 1.87 (g/dL) in three lactation. HEM contains mostly iron body and is the first functional substance that decreases when the amount of iron in the body becomes insufficient.

Shrikhande et al. (2008) found that in the early stage of lactation average hemoglobin concentration was of 9.08 g% [15]. HEM levels vary by species [8]. In Fig. 5 one can see the

average values for hemoglobin (a) and HCT (b). HEM presents the lowest values in lactation 2, 8.32 ± 2.01 (g/dL) and higher lactation 5 10.35 ± 0.96 (g/dL). HCT varies as follows: lowest averages are 26.71 ± 1.28 L1 and highest in L5, 29.87 ± 1.07 , respectively. Lymphocytes had role in ensuring immunity delayed cellular or tissue that occurs after some chronic bacterial or viral infections. WBC are cells with true nucleus and intense metabolism and are present in lymph, interstitial fluid, plasma, but with high variations [8]. Lymphocytes vary quite

broad, with mean values in L1, 3.2 ± 2.09 and 6.17 ± 2.03 , in L5. Fig. 6 presents the average values for WBC and lymphocytes in Bălțată Românească breed, depending on lactation. Granulocytes and platelets are shown in Fig. 7. Platelets have very important role in hemostasis. Granulocytes vary as follows: the lowest average values are L1, 4.75 ± 1.18 , and the highest in L4, 7.03 ± 2.04 . Platelets do not show a linear increase. The highest values are in L3, L5, with values of 312 ± 1.69 and 322 ± 2.91 , respectively.

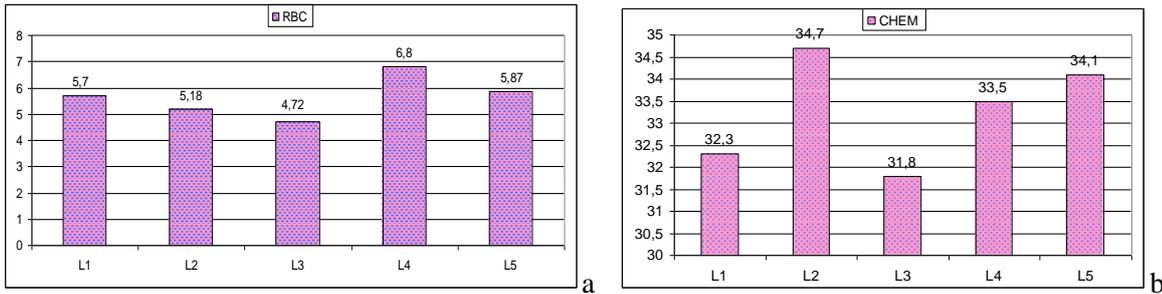


Figure 4. The mean values for RBC (a) and CHEM (b) Bălțată Românească breed cows according to lactation

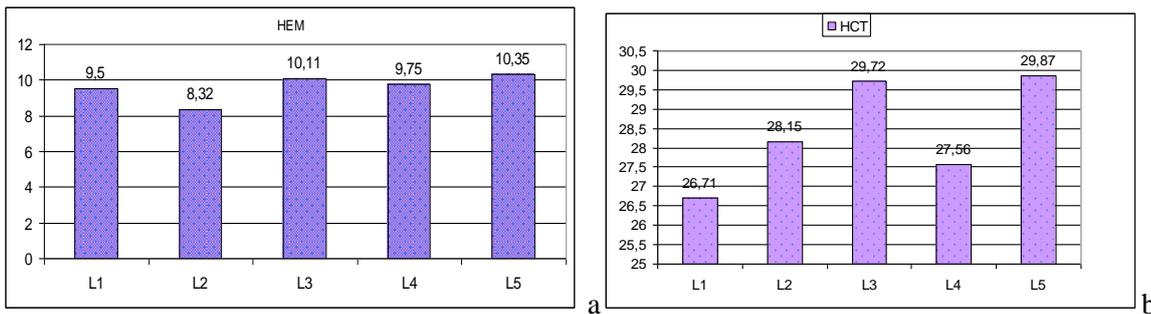


Figure 5. The mean values for HEM (a) and HCT (b) Bălțată Românească breed cows according to lactation

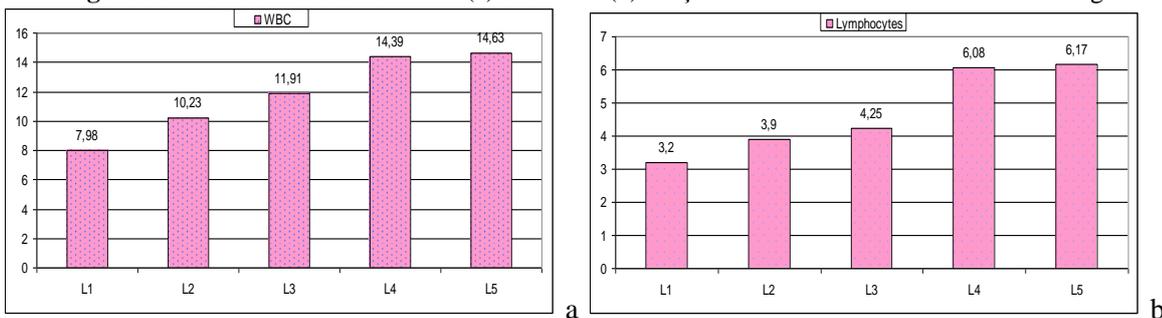


Figure 6. The average values for WBC (a) and lymphocytes (b) breed cows according to lactation

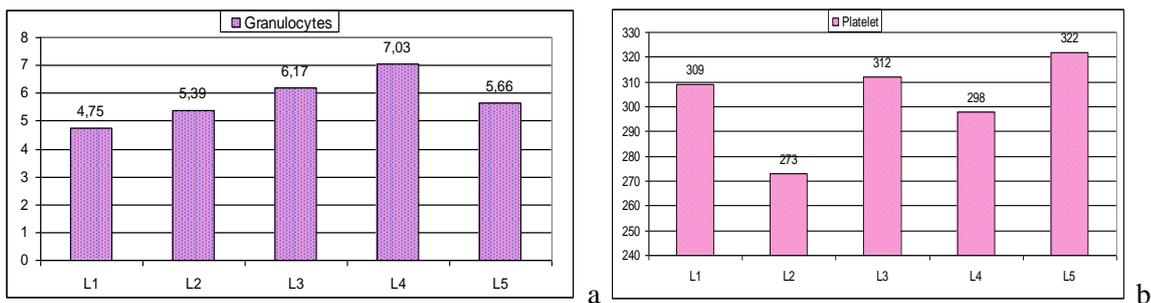


Figure 7. The mean granulocyte (a) and platelet (b) breed cows according to lactation

Studies on metabolic profile are made by other authors: Bjerre-Harpøth et al. (2012), assess metabolic changes in different stages of lactation cows; Shrikhande et al. (2008) studied the influence of season on the main constituents of blood [1, 15].

4. Conclusions

From this study we can see that the haematological profile in Bălțată Românească breed is within the limits reported in the literature. Lactation has influence over the content of fat and lactose from milk, reaching the highest values in lactation 4.

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