CONCENTRATIONS OF IGG, IGA AND IGM IMMUNOGLOBULIN TYPES IN COLOSTRUM MILK DEPENDING ON THE SEASON

RADUCAN George Gabriel, TODEA Neli Georgeta, VINTER Gabriel Nicolae
SCDA LOVRIN
Corresponding author:gabi2006george@yahoo.com

Abstract. *The aim of the paper was to study the evolution of the immunoglobulin types IgG, IgA and IgM concentrations during the first three days postpartum in Romanian Black and White cows. Samples of colostrum were collected at calving and at 4-hour interval for three days. Samples were analyzed for immunoglobulin concentration using ELISA test. . Immunoglobulin Ig G concentration in colostrum milk was higher in the warm season than in the cold season. The concentration of immunoglobulin Ig A in colostrum milk was higher in the warm season than in the cold season. Immunoglobulin Ig M concentration in colostrum milk was higher in the warm season than in the cold season. In this study, twelve cows from the Romanian black and white breed were taken into consideration from the farm located in Covaci, three of them cows calving in the hot season and nine in the cold season. Four-to four-hour colostral milk samples were taken (18 milkings / cow), immediately after calving, for three days, resulting in 54 samples in cows that calved in the hot season and 162 samples in cows that they have in the cold season. From the data presented it can be seen that the average daily amount of IgG of cows that calved during the hot season (41.89 mg / ml) is higher (p <0.001) by 6.06 mg / ml than that registered in cows that they gave birth in the cold season (35.83 mg / ml), a very statistically significant difference. From the data presented, it can be seen that the average daily amount of IgM of cows that calved during the warm season (4.78 mg / ml) is higher (p> 0.01) by 0.63 mg / ml than that recorded in the case in calves that gave birth in the cold season (4.14 mg / ml), a statistically significant difference*

Keywords: colostrum, immunoglobulin IgG, IgA an IgM, Romanian black and white breed.

INTRODUCTION

Of the bovine products, milk is the most important due to its complex chemical composition[15,12], biological value and high digestibility[4]. It contains over 100 substances needed by the human body, all 20 amino acids, 10 fatty acids, 25 vitamins and 45 mineral elements[7,9]. Expressed in calories, the nutritional value of one liter of milk is equivalent to approx. 400 g pork, 750 g veal, 7-8 eggs, 500 g fish and 125 g bread.

MATERIAL AND METHODS

Samples of colostrum were collected at calving and at 4-hour interval for three days. Samples were analyzed for immunoglobulin concentration using ELISA test. . Immunoglobulin Ig G concentration in colostrum milk was higher in the warm season than in the cold season.

RESULTS AND DISCUSSIONS

From the data presented it can be seen that the average daily amount of IgA of cows that calved during the warm season (3.55 mg / ml) is lower (p <0.05) by 0.44 mg / ml than that recorded in the case in calves that gave birth in the cold season (3.11 mg / ml), statistically significant difference.

Regarding the study, twelve cows from the Baltic breed were taken into consideration with the Romanian black from the farm located in Covaci, while there are three places that fit in the warm season and nine in the received season.

Four-hour colostral milk samples were taken in 18 hours (18 milkings / cow), immediately after calving, for three days, resulting in 54 vacant and fetal care samples in the warm season and 162 samples from cows that have cold season.

Table 1. presents average, dispersed indices, differences and different meanings regarding the production of colostrum milk in relation to the holiday season in the Balti breed with Romanian black from the farm located in Covaci.

This can be presented for the average daily production of colostrum milk for holiday care and the warm season (12.56 kg) is higher (p <0.01) by 0.77 kg when presented in the holiday care of the unborn cold season (11.79 kg), significant statistical difference.

The coefficient of variability is 7,970 for vacant care in summer, and 11,362 for cow care in winter

Table 1.

The average values and indices of the dispersion for the daily production of colostral milk in relation to the calving season in the cattle from the Baltic breed with Romanian black from the farm located in Covaci

Daily production ofcolostum milk (kg)			
Specification	Summer	Winter	Difference and significance
n	54	162	
Media ± Sx (%)	12,56±0,13	11,79±0,10	-0,77**
s	1,00	1,34	
C.V. %	7,970	11,362	

* p<0,05 ** p<0,01 *** p<0,001 ns p>0,05

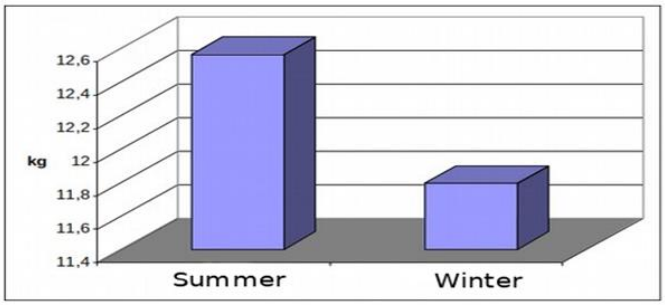

Fig.1. The average values for the production of colostral milk in relation to the calving season in Romanian Baltic cattle with Romanian black from the farm located in Covaci

The experimental data are in agreement with those of the literature, the cows that gave birth in the hot season have an average colostral milk production higher than the cows that calved in the cold seaso Romanian Baltic cattle with Romanian black from the farm located in Covaci

Table 2

The average values and the dispersion indices for the daily quantity of IgG in relation to the calving season in the cattle from the Baltic breed with Romanian black from the farm located in Covaci.

Amount of IgG (mg/ml)			
Specification	Summer	Winter	Difference and significance
n	54	162	
Media ± Sx (mg/ml)	41,89±1,83	35,83±1,07	-6,06***
s	13,50	13,65	
C.V. %	32,242	38,100	

* p<0,05 ** p<0,01 *** p<0,001 ns p>0,05

Table 2 presents the average values, the dispersion indices, the differences and the significance of the differences regarding the amount of IgG in relation to the calving season in the Romanian Baltic cattle with the Romanian black from the farm located in Covaci. From the data presented it can be seen that the average daily amount of IgG of cows that calved during the warm season (41.89 mg / ml) is higher (p <0.001) by 6.06 mg / ml than that registered in cows that they gave birth in the cold season

(35.83 mg / ml), a very statistically significant difference. The coefficient of variability has the value of 32,242 in cows that calved in summer and 38,100 in cows that calved in winter.

Figure 2. graphically shows the average values for the average daily amount of IgG in colostrum milk in relation to the calendar season. The experimental data are in agreement with those of the literature, the cows that gave birth in the warm season have an average amount of IgG higher than the cows that gave birth in the cold season.

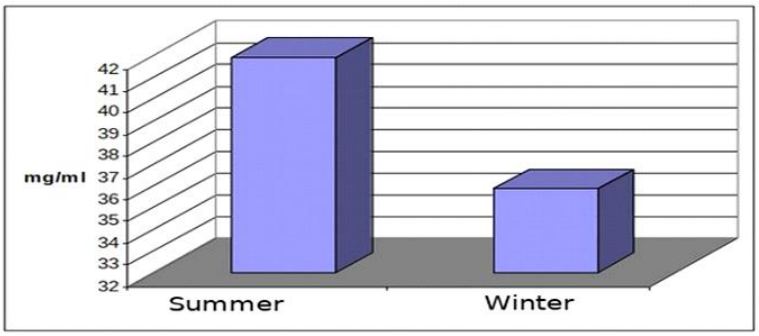

Fig.2. The average values for the amount of IgG in relation to the calving season in Romanian Baltic cattle with Romanian black from the farm located in Covaci

Table 3 presents the average values, the dispersion indices, the differences and the significance of the differences regarding the amount of IgA in relation to the calving season in the Romanian Baltic cattle with Romanian black from the farm located in Covaci.From the data presented it can be seen that the average daily amount of IgA of cows that calved in the warm season (3.55 mg / ml) is lower ($p < 0.05$) by 0.44 mg / ml than that registered in the case in calves that gave birth in the cold season (3.11 mg / ml), statistically significant difference.The coefficient of variability has the value of 35,486 in cows that calved in summer and 45,493 in cows that calved in winter

Table 3

The average values and the dispersion indices for the daily quantity of IgG in relation to the calving season in the cattle from the Baltic breed with Romanian black from the farm located in Covaci.

Amount of IgA (mg/ml)			
Specification	Summer	Winter	Difference and significance
n	54	162	
Media ± Sx (mg/ml)	3,55±0,17	3,11±0,11	-0,44*
s	1,26	1,41	
C.V. %	35,486	45,493	

* p<0,05 ** p<0,01 *** p<0,001 ns p>0,05

Table 4 presents the average values, the dispersion indices, the differences and the significance of the differences regarding the amount of IgM in relation to the calving season in the cattle from the Baltic breed with the Romanian black from the farm located in Covaci.

From the data presented, it can be seen that the average daily amount of IgM of cows that calved during the warm season (4.78 mg / ml) is higher ($p > 0.01$) by 0.63 mg / ml than that recorded in the case in calves that gave birth in the cold season (4.14 mg / ml), a statistically significant difference.

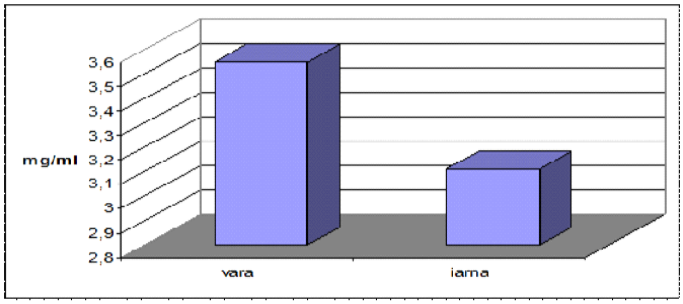

Fig.3 The average values and the dispersion indices for the daily quantity of IgA in relation to the calving season in the cattle from the Baltic breed with Romanian black from the farm located in Covaci

The coefficient of variability has the value of 34,103 in cows that calved in summer and 34,170 in cows that calved in winter

Table 4

The average values and indices of the dispersion for the daily quantity of IgM in relation to the calving season in the Romanian Baltic cattle with Romanian black from the farm located in Covaci.

Amount of IgM (mg/ml)			
Specification	Summer	Winter	Difference and significance
n	54	162	
Media ± Sx (mg/ml)	4,78±0,22	4,14±0,11	-0,63**
s	1,63	1,41	
C.V. %	34,103	34,170	

*** p<0,05 ** p<0,01 *** p<0,001 ns p>0**

Figure 4 graphically shows the average values for the daily amount of IgM in colostrum milk in relation to the calendar season.The experimental data are in agreement with those of the literature, the cows that gave birth in the hot season have an average amount of IgM higher than the cows that calved in the cold season.

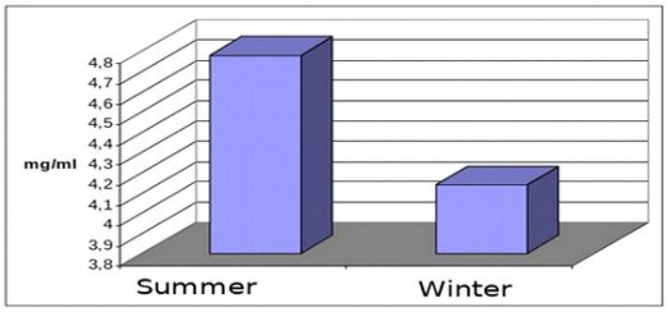

Figure 4. The average values for the amount of IgM in relation to the calving season for the cattle from the Baltic breed with Romanian black from the farm located in Covaci

CONCLUSIONS

The average daily amount of IgG of cows that calved in the warm season (41.89 mg / ml) is higher by 6.06 mg / ml than that recorded in cows that calved in the cold season (35.83 mg / ml).

The average daily amount of IgA of cows that calved in the warm season (3.55 mg / ml) is lower ($p < 0.05$) by 0.44 mg / ml than that recorded in cows that calved in the

cold season (3.11 mg / ml).

The average daily amount of IgM of cows that calved in the warm season (4.78 mg / ml) is higher ($p > 0.01$) by 0.63 mg / ml than that recorded in cows that calved in the cold season (4.14 mg / ml) distinct statistically significant difference

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