

Adaptability Indicators of Holstein Cows in the Specific Climatic Conditions of Karakalpakstan

Ibadullaeva Amina Saginbaevna¹, Aknazarov Doniyor Karriboyevich²,
Turdimuratova Gulida Nukusbayqizi³, Jumabaev Berikbay Kuatbaevich⁴.

¹Doctor of Philosophy (PhD) of agricultural sciences, Nukus branch of Tashkent state agrarian university, Nukus, R. Abdambetov street.

E-mail: Ibadullaeva-85@mail.ru, tel: +998994196167, +998913056761

²Master degree student

³⁻⁴Bachelor degree student

Abstract

Studies have shown that the clinical and hematological parameters of imported Holstein cows in Karakalpakstan are at the level of physiological norms, regardless of the seasons, and in our studies, Holstein cows imported from Poland have a high heat resistance index and are well adapted to our specific hot climates.

Key words: breed, Holstein, cow, productivity, clinical, hematological, body temperature, heart rate, respiration.

1. Introduction

For satisfying the demand of the population of the Republic for food products, it is particularly and practically important to increase the productivity of cattle and create high-yielding dairy herds. For this purpose, in recent years, many cattle with high genetic potential in terms of productivity have been imported to our country from European countries where dairy cattle is developed. The study of their clinical, hematological and heat resistance index indicators is of great importance in making full use of their genetic potential in terms of productivity and in assessing the degree of adaptation of cows to specific conditions. Taking into consideration all of these we studied adaptability indicators of cows under experiment.

2. Methods of research

In this work methods of research generally accepted in zootechnics were used.

3. Results and discussion

In order to study this issue, we conducted a study on Holstein cows imported from Poland at the farm "Ornak Nasl Chorva" in Ellikkala district of the Republic of Karakalpakstan. In the study, two groups of Holstein cows in lactation I were distinguished on the basis of the requirements of similarity traits. Group I (n = 15) cows were fed according to the accepted feeding norm on the farm, while group II (n = 15) cows were fed at 30% higher than this norm. The keeping conditions of the cows in both groups were the same.

Table 1 shows the clinical indicators of cows in the experimental groups.

Table 1
Seasonal changes in the clinical indicators of cows

Indicators	Groups			
	I		II	
	X±Sx	Cv,%	X±Sx	Cv,%
In spring				
Body temperature, °C	38,4±0,19	1,02	38,5±0,16	0,83
Heart rate (in 1 minute)	65,4±0,76	2,33	65,6±0,45	1,36
Respiration (in 1 minute)	26,0±0,35	2,72	26,8±0,42	3,12
In summer				
Body temperature, °C	38,2±0,22	1,14	38,2±0,83	0,95
Heart rate (in 1 minute)	67,6±0,57	1,69	67,8±0,55	1,61
Respiration (in 1 minute)	27,4±0,57	4,16	28,4±0,57	4,01
In autumn				
Body temperature, °C	38,2±0,22	1,14	38,2±0,83	0,95
Heart rate (in 1 minute)	67,6±0,57	1,69	67,8±0,55	1,61
Respiration (in 1 minute)	27,4±0,57	4,16	28,4±0,57	4,01
In winter				
Body temperature, °C	38,0±0,10	0,55	38,1±0,18	0,95
Heart rate (in 1 minute)	66,4±0,57	1,72	67,4±0,45	1,33
Respiration (in 1 minute)	26,0±0,61	4,71	27,2±0,42	3,07

Analysis of the table data showed that, regardless of the seasons, there was no significant difference between groups in body temperature, heart rate, and respiration rate of cows in both groups, which showed a slight increase in hot summer climates, but these values were at the physiological norm.

Similar results were obtained in the study of U.M.Kuchchiev (2006) in Holstein-bred black-and-white cows.

In assessing the degree of adaptation of cows to hot climatic conditions, we studied their heat resistance index (Table 2).

Table 2
Heat resistance index of cows

Groups	X±Sx	Cv,%	Limit
I	85,8±1,41	3,30	81,8-89,8
II	85,4±0,84	1,96	83,8-87,8

The data in the table show that there is almost no difference in the heat resistance index among the cows in the experimental groups, which indicates that they are the same and well adapted to our hot climatic conditions. These data correspond to the data of NT Shaymurodov

(2007) obtained in Holstein bred black-and-white I lactating cows. The authors concluded that cows of this genotype have an index of good adaptation to our hot climate conditions in summer.

We studied the hematological parameters of cows of different feeding levels in relation to the seasons, the results of which are given in Table 3.

Table 3
Seasonal changes in the blood composition of cows in the experimental groups

Blood indicators	Groups			
	I		II	
	X±Sx	Cv,%	X±Sx	Cv,%
In winter				
Erythrocytes, thousand/mm ³	6,96±0,12	3,35	7,31±0,07	1,93
Leukocytes, thousand/mm ³	8,05±0,10	2,43	8,37±0,11	2,70
Hemoglobin, g %	11,07±0,14	2,57	11,55±0,11	1,94
In spring				
Erythrocytes, thousand/mm ³	7,21±0,11	3,15	7,37±0,066	1,80
Leukocytes, thousand/mm ³	8,28±0,09	2,16	8,47±0,11	2,54
Hemoglobin, g %	11,29±0,14	2,49	11,64±0,12	2,16
In summer				
Erythrocytes, thousand/mm ³	7,32±0,12	3,36	7,48±0,045	1,21
Leukocytes, thousand/mm ³	8,41±0,10	2,38	8,55±0,11	2,56
Hemoglobin, g %	11,42±0,13	2,35	11,72±0,12	2,14
In autumn				
Erythrocytes, thousand/mm ³	7,16±0,13	3,58	7,29±0,069	1,90
Leukocytes, thousand/mm ³	8,23±0,11	2,63	8,37±0,10	2,53
Hemoglobin, g %	11,22±0,12	2,08	11,53±0,13	2,27

As shown in Table 3, the highest levels of erythrocytes, leukocytes and hemoglobin in the blood of cows in both groups were observed in summer, and in spring and autumn were characterized by close indicators. For example, in summer, the amount of erythrocytes in the blood of cows of group I compared to winter was 5.17%, leukocytes - 4.47%, hemoglobin - 3.16%, in group II these figures were increased to 2.32; 2.15 and 1.47%.

These data indicate that during the summer the cows are fed a large amount of nutritious, green foods which are rich in macro- and micronutrient, as a result of this their blood composition is enriched with morphological indicators and metabolic processes are active.

Our results are similar with the received data from the researches of N.A. Popov, V.A.Ivanov, E.G. Fedotova (2017). The author's study found that the blood content of high-yielding cows was higher than that of relatively low-yielding cows.

Our data are also consistent with the conclusions of N.V.Sivkin, N.I.Strekozov, S.A.Volkov, I.V.Gusev, O.B.Nejivova (2011). The authors' studies have shown that the blood of imported cows is well saturated with hematological parameters, which ensures a good level of milk production, as well as a degree of adaptation to local conditions.

It should be noted that the amount of erythrocytes in the blood of cows of group II in summer is 7.47% (R> 0.99) of winter cows of group I, 3.74% (R> 0.99) of spring, 2.18% of summer and 1.81% of autumn, leukocytes 6.21; 3.26; 1.66 and 3.89%, and hemoglobin 5.87;

3.81; 2.63 and 4.46% were found to be high. These data indicate that the blood of productive group II cows is well saturated with these elements at high levels during the summer.

4. Conclusions

1. Regardless of the seasons of our study, the content of erythrocytes, leukocytes and hemoglobin in the blood of cows in the experimental groups was at the level of physiological norm, and in the summer the amount of these elements in the blood of cows in these groups was slightly higher than in other seasons. This indicates that the blood of cows is well saturated with these elements during the summer, and their metabolic processes in the body are at a high level.
2. In imported Holstein cows, regardless of the level of their feeding, their clinical performance was at the level of the physiological norm, which indicates that they are well adapted to our specific climatic conditions.
3. Our research shows that Holstein cows imported from Poland have a high heat resistance index, which indicates that they are able to adapt well to our specific hot climatic conditions.

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