Clinical and hematological indicators of cows belonging to different selections of the holshtin breed by seasons

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Abstract. This paper examines the hematological (erythrocyte, leukocyte, total protein, hemoglobin, glucose) and clinical (respiration, heart rate, body temperature, belly movement) characteristics of Holstein dairy cows from various selections. These results showed that the blood of cows in our republic is saturated with morphological elements due to the same kind of feeding that they receive throughout the seasons, including concentrate feeding.

1 Introduction

Because people are striving to pay more attention to productive animals, one of the most essential challenges in our nation is the sustainable growth of cattle breeding.

In practically every country in the world, the field of animal husbandry is expanding quickly. This is due in part to the adoption of rapid production methods, which has led to a regular increase in both the number of farm animals and their output rate. The production of animal products and consumer goods derived from their processing at the level of demand is highly valued by nations all over the world.

Considering these facts, agricultural animal breeds that lead their nations in a variety of product categories (milk, meat, eggs, and wool) are imported from nations with highly developed animal husbandry, and the climate of our Republic It is advised that items be processed in the following locations in order to get high-quality products that are suitable for public consumption. In our study, Holstein imports from a number of developed nations, including the Netherlands, Germany, Canada, Latvia, and Denmark, were assessed for their compatibility with our Republic's climatic and haematological characteristics as well as their impact on milk output.

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2 Materials and methods

The "Siyob Shavkat Orzu" cow breeding farm in the Tayloq area of the Samarkand region is where we carried out the trials. In order to do this, n=10 dairy cows of the Holstein breed from Holland, Germany, and Denmark were chosen based on their constitution types (strong, thin-dense, and dense), and the experimental cows' clinical and hematological characteristics were assessed and contrasted throughout the course of the seasons.

3 Results and Discussion

Farm animals' bodies go through a variety of changes throughout the course of their personal growth, depending on their breed, age, physiological condition, and exposure to their surroundings.

We examined the clinical and physiological characteristics of the experimental cows, such as respiration, heart rate, and body temperature, and the results are shown in Table 1 to assess the adaptability of Holstein cows across various breeds. The body's inherent resistance, metabolic condition, physiological markers, and production may all be ascertained by looking at these indications.

Table 1. Clinical indicators of cows in experimental groups in II-lactation. (X ± Sx).

Selection	Constitution type	Body temperature, ºC	Breathing (times/ 1 minute)	heartbeat, (times/1 minute)
In Winter				
Netherlands	thin-dense	38.5 ± 0.22	32.3 ± 1.94	68.7 ± 1.24
	strong	38.7 ± 0.2	32.9 ± 2.49	69.7 ± 1.19
Germany	thin-dense	38.6 ± 0.11	32.3 ± 2.11	68.8 ± 0.78
	strong	38.9 ± 0.06	32.7 ± 2.48	70.1 ± 1.09
Denmark	thin-dense	38.3 ± 0.20	30.7 ± 1.34	69.9 ± 0.99
	strong	38.7 ± 0.19	31.4 ± 1.49	69.5 ± 1.12
In Spring				
Netherlands	thin-dense	38.7 ± 0.24	34.8 ± 1.15	69.1 ± 1.35
	strong	38.9 ± 0.25	35.1 ± 0.97	69.3 ± 1.21
Germany	thin-dense	38.6 ± 0.11	34.6 ± 1.01	70.9 ± 1.23
	strong	38.8 ± 0.12	35.2 ± 0.89	72.1 ± 1.01
Denmark	thin-dense	38.9 ± 0.14	33.9 ± 0.94	70.5 ± 1.52
	strong	39 ± 0.08	34.4 ± 0.87	70.9 ± 1.58
In Summer				
Netherlands	thin-dense	39.1 ± 0.19	41.9 ± 1.4	79.3 ± 3.14
	strong	39.3 ± 0.14	42.3 ± 1.99	79.9 ± 2.73
Germany	thin-dense	38.6 ± 0.11	39.8 ± 1.14	77.3 ± 2.85
	strong	38.8 ± 0.12	40.2 ± 1.72	78.1 ± 2.7
Denmark	thin-dense	38.9 ± 0.15	38.6 ± 1.98	72.3 ± 2.86
	strong	39 ± 0.08	39.3± 1.4	73.2 ± 2.7
In Autumn				
Netherlands	thin-dense	38.4 ± 0.22	35.9 ± 1.47	71.2 ± 1.42
	strong	38.7 ± 0.27	37.8 ± 1.69	71.8 ± 1.38
Germany	thin-dense	38.8 ± 0.12	36.8 ± 1.88	69.3 ± 1.05
	strong	38.9 ± 0.1	38.1 ± 2.0	69.9 ± 1.68
Denmark	thin-dense	38.6 ± 0.23	33.9 ± 1.15	68.9 ± 1.11
	strong	38.9 ± 0.11	35.4 ± 1.26	69.1 ± 1.5

The clinical indicators of the cows' bodies in the experimental groups were at the standard level, according to the examination of the data in Table 1. On the other hand, summer physiological processes in cows with a thin, dense, and robust constitution are slightly faster than those in the winter. Assume that in the summer, the body temperature of cows belonging to group I, which has a thin-dense composition, is 0.5 ºC or 0.01% higher than that of cows belonging to group III, and that their respiration is 2.1 or 5% lower. was p, and there was a 2 or 2.5% increase in heart rate. These measures were, in comparison to group V, 0.2 ºC or 0.5%, 3.3 or 7.8%, and 7 or 8.8% higher, respectively. Compared to cows of strong type of group IV, cows with strong constitutions of group II had higher summertime body temperatures by 0.5 ºC or 1.27%, respirations by 2.1 or 4.96%, and heart rates by 3 or 7%. In comparison to cows of group VI with the same constitution, cows with robust constitutions in group II had greater body temperature (by 0.3 ºC or 0.76%), respiration (by 3 or 7%), and heart rate (by 6.7 or 8.3%).

These physiological processes in the winter months resulted in 0.1 ºC, or 0.26%, lower body temperatures for Golishtin cows of the thin-dense constitution type in Iguruh, in group III, respectively; no discernible change in respiration was found, and 0.1 or 0 was 14% lower heart rates. Consequently, compared to group V, there was a difference of 0.2 ºC or 0.51% in heart rate, 1.6 ºC or 4.95% in respiration, and 1.2 ºC or 1.76% in heart rate. Group II cows with robust constitutions had a winter body temperature that was 0.2 ºC (0.5%) lower than group IV, respiration that was 0.2 (0.6%) greater, and a heart rate that was 0.4 (0.57%) higher. The strong-constitutioned cows in group II did not seem to have any difference in body temperature, respiration was 1.5 or 0.04% higher, and heart rate was 0.2 or 0.28% higher than those in group VI with those similar characteristics.

The process of Holstein cows adapting to the new ecological climate was aided by the saturation of their blood with components required by their bodies, which also led to an increase in output. These indicators are mentioned in Table 2 below.

Table 2 analysis indicates that during the winter, the levels of erythrocytes, leukocytes, hemoglobin, total protein, and glucose in Holstein cows belonging to the Dutch selection of group I, which have a thin-dense constitution type, are comparable to those of Holstein cows belonging to the German selection of group II. There was no discernible variation in the total protein and glucose markers at 0.1 or 1.61%, 0.2 or 2.1%, 12.2 or 9.92%. According to erythrocyte, hemoglobin, and total protein indicators, it belongs to group III, Leukocyte and glucose levels were lower by 0.4 or 6.45%, 2.6 or 2.11%, 2.1 or 2.99% compared to Holstein cows of the fine-dense constitution type of Danish selection. 0.7 or 7.36%, 0.1 or 3.44% were prioritized. There was no difference in the glucose levels of the cows in the strong constitution type group I, which had 0.1 or 1.56%, 0.2 or 2.08%, 9.8 or 7.68%, 0.7 or 0 and 96% higher. Indicators for group III leukocyte and glucose levels are 0.7 or 7.29%, prioritized 0.1 or 3.44%, whereas indicators for group III erythrocyte, hemoglobin, and total protein are lower by 0.3 or 4.68%, 3.7 or 2.89%, and 1.6 or 2.21%.

No change in glucose levels was seen throughout the summer months for these indicators: 0.1 or 1.58%, 0.2 or 2.08%, 11.3 or 9.18%, 1.3 or 9.18%, and 1.3 or 1.8% preference. compared to group III, hemoglobin, total protein, glucose, and 1.1 or 1.52%, 0.7 or 7.29%, 0.4 or 6.34%, and 0 or 3.44% lower, respectively. When compared to group II, Holstein cows of the strong constitution type in group I had 0.1 or 1.53%, 0.2 or 2.06%, 7.8 or 6.06%, and 2.5 or 3.38%, respectively. There was no change in the quantity of glucose in the experimental cows whether the percentage was high. 0.3 less than group III, or 4.6% 5.7 or 4.43%, 1 or 1.35%, 0.1 or 3.33% less, and 0.7 or 7.21% more were. Apart from these physiological markers, we also observed the big belly movement of our experimental cows according to the season. In this instance, the huge abdomen often moves two to five times in two minutes. The huge abdomens of the experimental cows moved up to three or five times, and it was discovered that the action of the digestive organs was normal.

Table 2. Morphological indicators of blood of cows in experimental groups (X ± Sx).

Selection	Constitution type	Learned indicators				
		Erythrocytes, million/µl	Leukocytes, thousand/µl	Hemoglobin, g/l	Total protein, g/l	Glucose mmol/l
In Winter						
Netherlands	thin-dense	6.2±0.21	9.5±0.33	122.9±3.48	70.1±1.41	2.9±0.054
	strong	6.4±0.17	9.6±0.26	127.6±1.84	72.3±2.24	3.0±0.05
Germany	thin-dense	6.1±0.11	9.3±0.22	110.7±2.96	70.1±1.83	2.9±0.04
	strong	6.3±0.13	9.4±0.29	117.8±2.28	71.6±1.53	3.0±0.067
Denmark	thin-dense	6.6±0.17	8.8±0.27	125.5±2.7	72.2±1.64	3.0±0.19
	strong	6.7±0.14	8.9±0.25	131.3±4.1	73.9±1.56	3.1±0.06
In Spring						
Netherlands	thin-dense	6.7±0.153	8.9±0.22	118.8±2.81	71.9±1.99	2.9±0.054
	strong	6.9±0.151	9.1±0.19	125.6±2.32	72.8±1.61	3.1±0.052
Germany	thin-dense	6.5±0.166	8.6±0.18	111.7±3.27	70.5±1.53	2.9±0.038
	strong	6.6±0.15	9.0±0.21	120.8±3.11	71.1±1.66	3.0±0.067
Denmark	thin-dense	6.7±0.153	8.8±0.19	124.3±2.12	72.2±1.99	2.9±0.072
	strong	6.7±0.12	8.9±0.19	129.1±3.85	72.4±1.13	3.1±0.057
In Summer						
Netherlands	thin-dense	6.3±0.21	9.6±0.39	123.0±3.47	72.1±2.08	2.9±0.054
	strong	6.5±0.17	9.7±0.34	128.6±1.96	73.8±2.1	3.0±0.05
Germany	thin-dense	6.2±0.13	9.4±0.22	111.7±3.27	70.8±1.6	2.9±0.04
	strong	6.4±0.12	9.5±0.27	120.8±3.11	71.3±1.7	3.0±0.067
Denmark	thin-dense	6.7±0.15	8.9±0.26	129.5±2.52	73.2±1.83	3.0±0.19
	strong	6.8±0.10	9.0±0.28	134.3±3.35	74.8±1.65	3.1±0.06
In Autumn						
Netherlands	thin-dense	6.5±0.17	8.6±0.21	125.8±3.32	68.9±1.6	3.0±0.05
	strong	6.7±0.14	8.9±0.209	127.6±2.1	70.8±1.3	2.9±0.054
Germany	thin-dense	6.4±0.15	8.7±0.25	119.7±3.5	69.1±1.2	2.9±0.038
	strong	6.6±0.14	8.8±0.18	120.5±3.03	69.8±1.4	3.1±0.047
Denmark	thin-dense	6.8±0.10	8.9±0.26	124.5±3.05	70.2±1.9	3.0±0.047
	strong	6.7±0.018	9.1±0.25	128.3±2.9	70.5±1.33	3.1±0.057

4 Conclusion

The study's findings indicate that the clinical parameters of all the cow groups fell within the normal range. The findings also indicate that the summer's high air temperature had an impact on the cows' respiration, heart rate, body temperature, large abdominal movement, and hematopoiesis. They were active, as evidenced by leukocyte, total protein, and hemoglobin levels. There was a noticeable variation across the groups, but regardless of the season, the body temperature, heart rate, and respiration rates of the cows in every group were within the range of the physiological norm.

Our study has shown that consistent feeding and feeding that is enhanced with mineral substances not only guarantees their excellent milk production but also saturates their blood with form elements and triggers a regular metabolism in their bodies.

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