

Comparative Effects of Miosta-H and Bodifors Biostimulants on Calves' Blood Parameters and Non-Specific Immune Defense

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Received: 2026, 04, Feb
Accepted: 2026, 10, Mar
Published: 2026, 25, Apr

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Annotation: This scientific article presents the results of a comparative study on the effects of the biostimulants Miosta-H and Bodifors on calves' blood parameters and their non-specific immune defense mechanisms. The administration of Miosta-H demonstrated a significant positive effect on the morphological and biochemical parameters of calf blood, as well as on the phagocytic, lysozyme, and bactericidal activities of non-specific immune components in blood serum compared to the control group. A similar effect was also observed in calves treated with Bodifors. The findings indicate that both biostimulants have a pronounced influence on blood parameters and enhance both cellular and humoral immunity in calves.

Keywords: Miosta-H, Bodifors, calf, biostimulant, morphological, biochemical, cellular immunity, humoral immunity, g/L, mmol/L, percentage.

Introduction

Currently, cattle breeding is one of the leading sectors of animal husbandry, playing a crucial role in ensuring a stable supply of high-quality meat and dairy products to the population [1].

According to the Resolution No. PQ-322 of the President of the Republic of Uzbekistan dated October 31, 2025, titled "On additional measures to ensure stable provision of the population with food products," it is planned over the next three years to increase the number of cattle by 445 thousand head, sheep and goats by 1.7 million head, poultry by 10.3 million head, and fish production by 54 thousand tons. This resolution serves as a strategic framework for the development of various branches of animal husbandry [2-3].

In this context, ensuring the supply of safe and high-quality livestock products and strengthening food security requires the effective application of modern veterinary preparations. Therefore, this study aims to comparatively evaluate the effects of Miosta-H and Bodifors biostimulants on calves' blood parameters and their non-specific immune defense mechanisms [4].

Materials and Methods

The experimental studies were conducted on a cattle farm named "ABDUOLIM QUDRATOV" located in the Sho'rchi district of Surkhandarya region. A total of 9 calves of the Red Steppe breed, aged 6 months, were selected for the study.

The calves were divided into three groups of three animals each:

Group 1 (Experimental): Calves were administered Miosta-H intramuscularly in the neck region at a dose of 1.5 ml. The same dose was repeated on the 30th day of the experiment.

Group 2 (Experimental): Calves received Bodifors at a dose of 6 ml per animal via intramuscular injection. The preparation was administered once every 14 days, totaling four injections.

Group 3 (Control): Calves did not receive any treatment.

All experimental and control animals were maintained under standard farm feeding conditions based on the daily ration. The experiment lasted for 2 months.

At the end of the study, blood samples were collected from all calves. Morphological and biochemical parameters were analyzed using "BIOBASE BK-6190" and "Mindray BA-88A" hematology analyzers. Additionally, indicators of non-specific immune defense in blood serum were assessed and comparatively analyzed [5].

Results of the Study

The results of the experimental study are presented in Tables 1 and 2 and reflect the effects of Miosta-H and Bodifors biostimulants on hematological, biochemical, and immunological parameters of calves. All values are expressed as mean \pm standard error ($X \pm Sx$, $n = 9$) [6].

Table 1 demonstrates the morphological and biochemical parameters of blood in the control and experimental groups. The analysis showed that the administration of Miosta-H resulted in more pronounced positive changes compared to the control group. In particular, erythrocyte count increased by 5.72%, leukocytes by 2.04%, hemoglobin by 3.49%, total protein by 4.04%, albumins by 3.19%, calcium by 4.04%, phosphorus by 3.32%, AST by 4.5%, and ALT by 12.7%. At the same time, globulin levels did not show significant changes compared to the control group [7-8].

In calves treated with Bodifors, improvements in blood parameters were also observed, although to a lesser extent than in the Miosta-H group. Specifically, erythrocyte count increased by 2.80%, total protein by 2.40%, albumins by 4.0%, calcium by 1.84%, phosphorus by 1.60%, AST by 3.25%, and ALT by 5.45% [9]. However, leukocyte count, hemoglobin concentration, and globulin levels did not differ significantly from those of the control group.

Table 1. Morphological and biochemical parameters of blood in control and experimental calves ($X \pm Sx$, $n = 9$).

Indicators

Groups

	Control	Experimental Group 1 (Miosta-H)	Experimental Group 2 (Bodifors)
Erythrocytes ($10^{12}/L$)	8,21±0,08	8,68±0,05	8,44±0,04
Leukocytes ($10^9/L$)	8,32 ±0,09	8,49±0,12	8,41±0,07
Hemoglobin (g/L)	117,2±0,63	121, ±0,84	118,4±0,79
Total protein (g/L)	66,7±0,78	69,4±0,63	68,3±0,57
Albumins (g/L)	34,5±0,48	35,6±0,41	35,9±0,39
Globulins (g/L)	39, 8±0,39	39,9±0,46	40,1±0,37
Calcium (mmol/L)	2,72±0,31	2,83±0,36	2,77±0,28
Phosphorus (mmol/L)	1,88±0,18	1,94±0,27	1,91±0,24
AST (mmol/L)	1,54±0,11	1,61±0,18	1,59±0,20
ALT (mmol/L)	0,55±0,07	0,62±0,08	0,58±0,04

According to the data presented in Table 1, calves treated with the Miosta-H biostimulant showed notable improvements in morphological and biochemical blood parameters compared to the control group. Specifically, erythrocyte count increased by 5.72%, leukocytes by 2.04%, hemoglobin by 3.49%, total protein by 4.04%, albumins by 3.19%, calcium by 4.04%, phosphorus by 3.32%, AST by 4.5%, and ALT by 12.7%. No significant changes were observed in globulin levels [11].

Similarly, in calves treated with Bodifors (experimental group 2), erythrocytes increased by 2.80%, total protein by 2.40%, albumins by 4.0%, calcium by 1.84%, phosphorus by 1.60%, AST by 3.25%, and ALT by 5.4% compared to the control group [12]. However, leukocyte count, hemoglobin, and globulin levels did not show statistically significant differences from the control.

Table 2 presents the indicators of non-specific immune defense in calves. The obtained results indicate that both biostimulants enhanced innate immune responses. In the Miosta-H group, phagocytic activity increased by 5.16%, lysozyme activity by 16.9%, and bactericidal activity by 3.0% compared to the control group.

Similarly, in the Bodifors-treated group, phagocytic activity increased by 4.36%, lysozyme activity by 13.3%, and bactericidal activity by 3.3%.

Overall, the findings demonstrate that both Miosta-H and Bodifors biostimulants positively influence hematological and biochemical blood parameters and significantly enhance non-specific immune defense mechanisms in calves, including both cellular and humoral components of immunity.

Table 2. Indicators of non-specific immune defense in control and experimental calves (n = 9).

Group	Age (days)	Phagocytic activity (%)	Lysozyme activity (%)	Bactericidal activity (%)
Control	180	60.1 ± 1.55	19.4 ± 0.76	57.0 ± 0.97
Control	240	61.9 ± 1.43	19.5 ± 0.75	57.5 ± 0.95
Miosta-H	180	62.2 ± 2.02	22.2 ± 0.73	58.1 ± 1.07

Miosta-H	240	65.1 ± 1.86	22.8 ± 0.66	59.2 ± 1.01
Bodifors	180	62.3 ± 1.58	21.8 ± 0.85	58.6 ± 1.41
Bodifors	240	64.6 ± 1.57	24.1 ± 0.78	59.4 ± 1.37

The results indicate that in calves treated with Miosta-H, phagocytic activity increased by 5.16%, lysozyme activity by 16.9%, and bactericidal activity by 3.0% compared to the control group [13]. In calves treated with Bodifors, these indicators increased by 4.36%, 13.3%, and 3.3%, respectively [14].

These findings demonstrate that both Miosta-H and Bodifors biostimulants enhance non-specific immune defense mechanisms in calves, particularly by stimulating cellular and humoral immunity [15].

Conclusion

Administration of the Miosta-H biostimulant led to an increase in erythrocytes by 5.72%, leukocytes by 2.04%, hemoglobin by 3.49%, total protein by 4.04%, albumins by 3.19%, calcium by 4.04%, phosphorus by 3.32%, AST by 4.5%, and ALT by 12.7%, while no significant changes were observed in globulin levels compared to the control group.

In calves treated with Bodifors, erythrocytes increased by 2.80%, total protein by 2.40%, albumins by 4.0%, calcium by 1.84%, phosphorus by 1.60%, AST by 3.25%, and ALT by 5.45%. No statistically significant differences were observed in leukocytes, hemoglobin, and globulin levels.

Both Miosta-H and Bodifors enhanced non-specific immune defense mechanisms, increasing phagocytic activity by 5.16% and 4.36%, lysozyme activity by 16.9% and 13.3%, and bactericidal activity by 3.0% and 3.3%, respectively.

The use of Miosta-H and Bodifors biostimulants had a positive effect on morphological and biochemical blood parameters, as well as on the immune defense system of growing calves. Their application in cattle farming can contribute to improved productivity and economic efficiency.

References

- [1] Government of the Republic of Uzbekistan, "On additional measures to ensure stable provision of the population with food products," Presidential Resolution No. PQ-322, Oct. 31, 2025. [Online]. Available: <http://www.lex.uz>
- [2] Instructions for the use of the veterinary drug Bodifors, "Toshbolta ota" LLC, Uzbekistan, 2023.
- [3] V. A. Boymatov et al., "Changes in clinical and biochemical parameters in cows with iodine deficiency," *Veterinariya*, no. 8, pp. 45–47, 2006.
- [4] Instructions for the use of the veterinary drug Miosta-H, LLC "Biostim," Russia, 2023.
- [5] V. A. Kozlova, Influence of some immunostimulants on the organism of cattle, Ph.D. dissertation, St. Petersburg, 2002.
- [6] V. Yu. Marevskaya, Activation of nonspecific resistance and biological potential of deep-pregnant cows and newborn calves using biostimulants, Author's abstract of dissertation, Cheboksary, 2010.
- [7] R. V. Petrov, *Immunology*. Moscow: Meditsina, 1983.
- [8] X. B. Yunusov, Yu. Salimov, I. Yu. Salimova, and T. T. Xatamov, *Pharmacology and*

- Toxicology. Tashkent: Lesson Press, 2023, p. 456.
- [9] Ibragimov, Ahmad Tulqinovich, Abdurashid Norquvvatovich Bozorov, and Komil Bahodirovich Chundilov. "Effects of Fluoride Compounds on Blood Parameters of Calves." *Central Asian Journal of Medical and Natural Science* 7.2 (2026): 142-146.
- [10] D. A. T. Ibragimov and A. P. Isometdinov, "Impact of Biostimulants on the Growth Dynamics and Developmental Performance of Calves", *AJBP*, vol. 2, no. 10, pp. 172–175, Oct. 2025.
- [11] A. T. Ibragimov and Yu. Salimov, "Harmful waste and their effects on the body," *Central Asian Journal of Theoretical and Applied Sciences*, vol. 3, Spain, 2022, pp. 328–330.
- [12] A. T. Ibragimov, Yu. Salimov, and U. T. Maxsudov, "Toxic effects of fluorine compounds on the animal organism," *Veterinariya meditsinasi*, no. 5, Tashkent, 2023, pp. 30–31.
- [13] A. T. Ibragimov and Yu. Salimov, "Tojikiston alyumin zavodi chiqindilarining qoramollar organizmiga ta'siri," *Veterinariya meditsinasi*, no. 3, 2024.
- [14] A. T. Ibragimov and Yu. Salimov, "Influence of industrial pollutants on animal health and productivity," *Veterinary Science and Practice*, Tashkent, 2021, pp. 45–48.
- [15] A. T. Ibragimov, Yu. Salimov, and U. T. Maxsudov, "Ecotoxicological assessment of environmental contaminants and their impact on livestock organisms," *International Journal of Veterinary Research*, vol. 12, no. 2, 2022, pp. 112–116.