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Research Article

COMPLEX EVALUATION OF BIOSTIMULANTS FOR PREVENTION OF IMMUNE SYSTEM DISORDERS AND HIGHLY PRODUCTIVE COWS AND IMPROVEMENT OF MILK QUALITY

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ABSTRACT

In practice, feed additives with various biological properties are used, such as biostimulants, modifiers, antioxidants, enzymes, phytobiotics, when fed to ruminants, an optimal rumen environment is created for microbial activity and digestion of food substrates in the diet. The research was to study biostimulants on milk production and the state of the immune system in cattle.

KEYWORDS

Feed additives, correction, immunostimulants, biostimulants, milk, livestock, leukocytes.

INTRODUCTION

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Relevance. The intensification of cattle breeding and the use of industrial technologies significantly increases the load on the cow's body and contributes to the strain of its functionality. Changing technological conditions of detention do not always correspond to the physiological needs of animals, and in this situation diseases arise, which are based on metabolic disorders. Among the complex of external conditions that affect the physical and chemical parameters of milk and their biological value, special attention should be paid to feeding dairy cattle. In addition, feed not only directly affects the productivity and quality of milk, but also indirectly affects the immune system. In recent years, in livestock farming, much attention has been paid to the development of a variety of additives that can increase milk productivity, milk fat content, increase the digestibility of feed and stimulate the metabolism of mineral and probiotic feed additives. In practice, feed additives with various biological properties are used, such as biostimulants, modifiers, antioxidants, enzymes, phytobiotics, when fed to ruminants, an optimal rumen environment is created for microbial activity and digestion of food substrates in the diet. Considering the above, an urgent problem is the creation and introduction into production of biostimulants intended for inclusion in mixed feeds and diets that have a beneficial effect on metabolism, animal productivity, the quality and safety of products of animal origin.

Purpose and objectives of the research. The main goal of the study was to study biostimulants on milk production and the state of the immune system in cattle.

To achieve the goal, the following tasks were set:

1. Determine the effect of a feed biostimulant on the milk productivity of cows and the quality of raw milk.
2. Study the biochemical parameters of cows' blood when using a biostimulator.
3. Assess the economic efficiency of introducing biostimulants into the diets of highly productive cows.

METHODS

Research was carried out using clinical-physiological, microbiological, veterinary-sanitary, zootechnical and mathematical methods. The effect of biostimulants in different doses on metabolic processes, productivity and quality of milk of cows was studied. The research was carried out on 32 dairy cows in the Zangiota district of the Tashkent region in 2021. Animals in the control and experimental groups received a diet consisting of wheat straw (0.6 kg), corn silage (23.0 kg), wheat haylage (50.0 kg), complete feed (14.58 kg), optigen (0 .05 kg) and alfalfa haylage (6.50 kg). The animals of the experimental groups received a mineral feed regulator in a dose of 300 g daily in addition to the main diet (BR) as part of a complete feed.

RESULTS AND DISCUSSION

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In accordance with the accepted scheme for zootechnical analysis of feed, the dry matter of the feed is the carrier of the nutritional value of the feed. The higher the dry matter content of the feed, the higher its nutritional value. It is known that the DM consumption of bulky feeds depends on the concentration of metabolic energy in them and the level of productivity. Animals received biostimulants for 30 days, 10 ml. intramuscularly. Hematological parameters of the blood of experimental cows. As can be seen from the data presented in the table, over the entire period of the experiment, the concentration of leukocytes in the control and experimental groups was within physiological norms and had an average value of 9.5 109/l in the control group and 9.9 109/l in the experimental groups. The content of lymphocytes at the beginning and at the end of the experiment in the control and experimental groups was within physiological norms and no significant changes were observed. Control group - average content for the entire period - 33.9%. Experienced groups: I – 27.4%; II – 27.8%; III – 29.01%.

Table 1 - Hematological parameters of the blood of experimental cows.

Index	Unit of measurement	Groups			
		Control	Experienced		
			I	II	III
Beginning of the experiment 1st day (n=12).					
1	2	3	4	5	6
Leukocytes	10^9/л	9,27±0,54	9,91±0,61	10,94±0,85	9,77±0,60
Lymphocytes	%	28,39±2,20	27,05±2,58	25,87±2,77	28,41±2,19
Basophils	%	10,57±0,67	9,17±0,57	11,18±1,75	9,41±0,82
Granulocytes	%	51,15±2,72	49,57±2,36	51,77±3,24	50,12±2,94
Red blood cells	10^{12}/л	9,45±0,58	8,70±0,30	9,65±0,62	9,16±0,60
Hemoglobin	г/дл	13,79±1,60	10,25±0,23*	10,16*±0,21	13,39±1,67
Thrombocytes	10^9/л	478,83±73,28	317,58±45,01	359,92±54,26	376,92±80,15
End of experiment, 60th day (n =12)					

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Leukocytes	10⁹/л	9,84±0,58	9,02±0,43	9,93±0,57	9,78±0,56
Lymphocytes	%	29,51±2,02	27,84±1,96	29,80±2,07	29,62±2,14
Basophils	%	8,89±0,65	9,08±0,33	8,56±0,50	8,63±0,51
Granulocytes	%	50,13±2,34	44,56±1,74	44,87±1,76	44,15±1,68*
Red blood cells	10¹²/л	8,66±0,28	8,08±0,25	8,16±0,22	8,12±0,22
Hemoglobin	г/дл	10,41±0,24	11,14±0,45	10,03±0,23	9,95±0,23
Thrombocytes	10⁹/л	293,25±41,72	340,46±46	295,42±38,76	286,17±36,30

Note: * $p<0.05$; ** $p<0.01$; compared to control

The ratio of basophils at the beginning of the experiment and at the end tended to decrease, namely in the control group it decreased by 15.9%. In the experimental groups it was 0.99%, 23.4 and 8.3%, respectively. All indicators were within physiological norms and no significant changes were observed. The content of granulocytes during the entire period of the experiment in comparison with the control in the experimental groups decreased by 11.2%, 10.5 and 11.9%, respectively, while being within physiological norms. At the beginning of the experiment, the content of the number of erythrocytes was within the maximum values of physiological norms (5-10*1012/l), at the end of the experiment it dropped to average values, namely in

in the control group - 8.66 (1012 /l), in the experimental group - 8.12 (1012 /l). The hemoglobin indicator of the experimental groups at the beginning of the experiment was lower than the values of the control group: in I - by 25.7%; in II – by 26.3%; in III – by 2.9%. The indicators of the control group and experimental group III were higher than physiological norms at the beginning of the experiment. At the end of the experiment, all indicators were within physiological norms and had an average value for the control group - 10.41 g/dl and the experimental group - 10.37 g/dl. Hematocrit values for the entire period of the experiment were within physiological norms (35-45%) and no significant changes were observed. The average value was: control group – 39.48%; I – 35.5%; II – 40.38%; III – 38.72%.

The number of platelets at the beginning of the experiment in the experimental groups was within physiological norms (250-450 1012/l), and the indicators in the control were higher. At the end of the experiment, all indicators were within physiological

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norms and no significant changes were observed. Data on milk production (MP) of animals for 100 days of lactation were obtained on the basis of daily records during each milking. The study period was divided into 5 additional periods of 20 days each. In general, research results have shown that the trend in the level of milk productivity is increasing. The subsequent increase is probably associated with the stabilization of the energy balance in the body of dairy cows. With the introduction of biostimulants in milk it increases, however, we did not observe an excess of the upper limit of the norm. In addition, it was found that in accordance with the selected analysis criteria in the studied population of animals, in 17.05% of cows the biostimulant corresponded to optimal values. The biostimulant tended to decrease as the milk productivity of animals increased, and increased as soon as the milk productivity of animals began to decline in the dynamics of milking days. The economic efficiency of feeding a biostimulant feed regulator in the diet of cows is the calculation of the economic feasibility of its use. The main indicators in the economic assessment were: the cost of feed, average daily milk yield and the market price of milk.

CONCLUSION

According to the task, further research was aimed at studying the effect of biostimulants on the productivity and metabolism of high-yielding cows. It is known that feeding, and as a consequence, the introduction of biostimulants, is one of the leading factors in ensuring high productivity of dairy livestock. This is explained by the fact that during lactation the animal's body is in a state of increased functional activity; complex processes of fermentation of feed through a huge number of bacteria, fungi, protozoa, as well as the absorption of nutrients and the synthesis of new ones, take place in the proventriculus. All this provides the animal with the necessary energy and nutrients, affects the physiological processes occurring in the body, which in turn helps to enhance metabolic processes, productive and reproductive phenomena. An important point in these processes is the ability to control rumen digestion by adjusting the diet through the use of various biostimulants.

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