UDC 636.2.087.7

Dynamics of hematological indexes lactating cows at use in their ration of the improved recipes of premixes

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The purpose. To study in dynamics of influence of author's recipes of premixes on hematological indexes of lactating cows. **Methods.** 2 groups of cows were formed using method of groups-analogs. The control group of animals was fed with premix P60-1; experimental group was fed with a premix based on author's recipe which removed deficiency of macro- and minor- components in basic diet. **Results.** Productivity of premixes in feeding lactating cows is proved at disbalance in a ration of minor components and mineral substances. **Conclusions.** The developed recipe of premixes positively influenced growth power and productivity of cows.

Key words: *cow, pregnancy, calving, ration, premix, blood.*

The manifestation of the genetic potential of productivity and the length of production use of cows requires the provision of vital elements in the body in an optimal correlation. The main source and means of supplying them to organs and tissues is blood, the composition of which depends on the full value of a balanced diet of animals. Constant monitoring of hematological parameters and the timely elimination of detected deviations from the norm contributes to the loss of animal health, and hence, the receipt of the necessary amount of products from them.

In this direction there is a certain amount of research. However, for various reasons, it is still not possible to completely eliminate the imbalance of the elements of nutrition in the diets of the herd, as a result, the genetic capacity of reproduction in most agroformations is only 75-80%. Therefore, further search for solutions to this problem is relevant.

The purpose of the research – to study the dynamics of the influence of author's recipes of premixes on the hematological parameters of lactation cows.

Materials and methods of research. An analysis of the feeding level of more than 5 thousand cows in 79 countries of Dnipropetrovsk, Mykolayiv, Kherson, Kharkiv, Zaporozhye, Luhansk and Kirovograd oblasts suggests that in their rations the carotene deficit reaches 40-60%, phosphorus and sulfur - 20 -40, lysine - 24-35, methionine - 11-22, copper - 10-54, zinc - 14-47, manganese - 35-45, cobalt - 30-40, magnesium - 25-65, calcium - 20 -30%.

Not a better position with a vitamin composition. In practice, for the solution of this problem, premixes and feed additives of domestic and foreign production are widely used, which offer to feed in different ratios with mixed fodders (1-5-10%) for a certain species of animals without considering them Physiological state and full-fledged diet. As a result, their effectiveness is greatly reduced.

We have developed a methodology for compiling recipes and their use, which fundamentally differs from general recommendations. Its essence is that only on the basis of studying the biochemistry of animal blood and the chemical composition of feed in the premix (additive) include those components and as many, which and what is missing in a particular diet (reference no. 1660667). Moreover, they are introduced into the feed directly for a specific herd (farm) in accordance with the identified deficiency of nutrition elements in the diet of cows and in the right amount.

Many years of repeated scientific research and testing in production conditions have been carried out to determine the effectiveness of this development. As a result, due to the optimal set of traditional feed in

the structure of the diet and the use of our premixes, the deficiency of the nutrients was eliminated, and the livelihood increased by 27-34%.

One of the researches was carried out in the agricultural company "Naukova" of the Dnipropetrovsk region. The control and research fops of full-age cows of Holstein pigs (by 15 heads) were formed by the method of group-analogues by age, regular lactation, periode of culture and productivity (5500-6500 kg of milk). The first to the main ration was added premix P60-1, the second (instead of it for balancing) - premixes for author's recipes. The research material was the blood that was taken from the jugular vein at the beginning of calving (15-20 days), 3- and 6-month oldness, before calving of cows, after 1, 3, 6, 10, 20 days after calving (table).

Research results. The total protein content of the serum of blood of cows of both experimental groups in all periods of the study (except for the preparatory) had significant differences. In animals of the control group in all periods the total protein was on the lower limit of standards, and in the trial - significantly higher ($P < 0.001$) and was at the level of the upper limit. With the increase in the thermal content, the concentration of total protein in the control group increased to a lesser extent than in the experimental group, and before the calving, this increase was significant ($P < 0.01$). The amount of protein in both groups in the first day after birth increased sharply, which is consistent with the data of other researchers [4, 5].

The content of γ-globulins in serum throughout the experiment has undergone major changes. In the control group of cows during the last 6 months of censorship, this indicator was lower than at the beginning of the experiment, and lower than in the experimental group. The pattern of reduction of globulins as the childbirth approaches are detected by other scientists [1]. The trend toward restoration of the concentration of γ-globulins in the control group was completed 20 days after calving, and in the trial, it was higher and not decreased throughout the experiment.

This indicates that the author's premixes increase the biosynthesis of glycoproteins, which predominantly propose a fraction of γ-globulins and increase their efficacy. We support the opinion of some scholars that increasing the synthesis of DNA and RNA in crossbred cows occurs under the influence of additives of trace elements - cobalt, copper, iodine [7].

Between the metabolism of proteins, nitrogen and nucleic acids there is a direct dependence, and between the concentration of urea, the residual nitrogen and the content of nucleic acids is inverse. This pattern is found in both groups, but in various quantitative ratios [1, 6].

Concentration of residual nitrogen in the blood serum due to the cow density was not constant. This process took place wavelike and with varying degrees of manifestation in different periods of colonization and after calving. In control group cows, the concentration of residual nitrogen decreased to the rest of the body, and on the first day after calving, it significantly increased ($P < 0.05$). In the first 6 days of lactation there was an increase, and in the next 14 days - again down to the level before the start of the experiment.

The experimental group also observed similar, but more pronounced in the 3rd month of cohort and in the first 20 days of lactation. Consequently, for the enrichment of rations premixes in the blood of cows less accumulate products not protein, but nitrogen-friendly nature, and amplify in their body anabolic processes.

During the period of colonization and the first 20 days of lactation, the content of urea in serum of blood of cows of both groups was significantly changed. In animals, the control group increased its concentration to 3 months. Cohesiveness This process lasted until the end of pregnancy and the first 6 days after calving. In the future, this figure has decreased. In the experimental group, the concentration of urea gradually decreased, reaching a minimum level of 1-3 days after calving. .

That is, in cows receiving author's premixes, there was an increase in the concentration of urea (as in the control), and decrease - as compared with the beginning of the experiment, and with the control group, this gap increased, reaching the maximum value on 3-tj Day after calving In the next 17 days the differences have decreased.

Since urea (as a final product of decomposition of proteins) in the lower concentration accumulated in the cows of the experimental group, in the tissues of the organism of these animals, to a lesser extent, the processes of decomposition of amino acids and to a greater extent - anabolic processes with the formation of plastic protein compounds. This is also confirmed by an increase in the content of the total protein in blood serum, which results in increased viability

Organism, increase in the concentration of proteins in milk and milk in the experimental group of cows.

The content of glucose (as one of the main indicators of the metabolism of carbohydrates in the body of cows) has undergone serious quantitative changes throughout the experiment. At first, her level in the cross was not very different between the groups, then she got worse. In the experimental group, this increase is preserved until the end of the cohesiveness, and in the control - up to 6 months. Before calving, the level of glucose decreased, and after calving in both groups increased.

Like other scientists [9], we believe that this is due to an increase in the somatotropic function of the pituitary gland and other hyperglycemic gorlomons. The difference in the content of glucose between the groups reached the maximum value during the first day after calving ($P < 0.01$). However, throughout the experiment, its level in the control group was on the lower limit of norm, and in the research - at the level of middle and upper limits. Consequently, author's premixes prevent the process of a sharp decrease in the concentration of glucose in the blood before and after calving of cows.

In the assessment of the orientation of the metabolism in animal organs, the concentration of ketone bodies in the blood, which is one of the main energy metabolites, is of particular importance [11]. In the period of cohesiveness and after calving, it varied with the same regularity in both groups. Thickness contributed to the accumulation of ketone bodies in the blood, and the moment of calving caused short-term decline in their concentration with subsequent increase after it [5]. However, the level of ketone bodies in the control group was at the upper limit of the norm and in some cases exceeded their maximum value, while in the experimental one, it was at the lower limit throughout the experiment ($P < 0.001$).

Thus, under the influence of copyright premixes accumulation blood intermediates metabolism of proteins, carbohydrates and fat (ketone bodies) were below normal for this type physiological and the animals, indicating that enhancement of metabolic processes and intensive intermediate products to cleavage final collapse substances This allows the body to get energy and more intense exercise biosynthesis plastic makromolekul. Comparative analysis of glucose and ketone bodies in the blood confirms the existence of their feedback.

The serum lipid content of the groups had serious differences during the introduction of premix cows into rations. In the control - there was a tendency to increase them only to a 3-month crop, and then reduce to the calving. For the same indicators at the beginning of the experiment, the pre-test group had an excess compared with the control, which lasted up to 6 months of colonization ($P < 0.01$).

In recent months, the cows were cows and during the first 3 days after colonization, there was a gradual decrease in the concentration of total lipids in the blood, and then, during the 17 days of the experiment, their concentration increased. The more pronounced and prolonged process of increasing the concentration of lipids was in the experimental group (even exceeding the upper limits of the norms), although cohesiveness and calving occurred on the metabolism of fats in both groups of animals.

The high level of lipids in the first period of lactation makes it possible in large quantities of withdrawal of fat with colostrum and moloch, which provides the calf with energy nutrients in the first days of life. Increasing the value of feeding cows due to author's premixes is confirmed by a significant positive correlation between the level of lipids in the blood and the amount of tiredness, the content of protein and Fat in milk with a level of lipids in the blood, that is, it positively affects the carbohydrate-fat, mineral and A-vitamin exchange, which is consistent with the results of studies of other scientists [2, 3, 9, 10].

The alkaline reservoir of blood plasma on the contrary to many biochemical parameters of blood of cows has changed naturally and in a natural way. In animals of the experimental group with the development of the depth of the body, it steadily decreased with a slight increase before calving and the maximum decrease in the calving day ($P < 0.01$). In the period of colonization, it was lower than in the

control group (P <0.01 -0.05), and in the first days after calving - the highest and remained until the 20th day of lactation. These changes can be explained by a decrease in the level of ketone bodies below the norm in the experimental group and elevated - in the control. The second factor explaining the reduction of alkaline reserve is the enhancement of oxidative-reducing processes during the period of colonization and, in particular, the formation of oxyhemoglobin in the capillaries of the lungs, which somewhat oxidizes the blood, and also reduces the alkaline reserve [8].

The balancing of ration of cows due to author's premixes that optimize the amino acid, macro, microelement and vitamin composition, has a positive effect on increasing the vitality of animals for the strength of oxidative-reducing processes during the period of colonization and, in particular, the formation of oxyhemoglobin in the capillaries of the lungs, which slightly oxidizes Blood, and also reduces the alkaline reserve [8].

Tabl. Dynamics of hematological indicators of cows X±Sx

	Physiological state											
Indicator	Before the calving		After the calving, days									
			1		3		6		10		20	
	control	research	control	research	control	research	control	research	control	research	control	experiment
Total protein in serum, g/l	74,5±3,4	87,0±2,3	65,0±1,8	82,2±1,9	69,3±1,3	83,2±0,9	70,9±0,7	84,9±1,4	71,0±1,0	86,0±0,8	74,5±2,0	86,06±1,6
Gamaglobulins in serum, g/l	26,1±1,9	32,0±0,8	23,6±1,2	37,6±1,5	21,3±1,3	36,0±1,5	23,6±2,6	34,3±1,5	23,5±2,6	31,71±0,9	20,7±1,1	29,2±0,5
DNA in serum, mg/l	3,6±0,5	6,2±0,6	1,8±0,1	3,9±0,3	2,2±0,1	5,3±0,2	4,3±0,3	6,0±0,4	3,9±0,5	7,4±0,5	4,4±0,5	6,9±0,8
RNA in serum, g/l	11,1±0,5	16,1±0,8	9,8±0,7	15,8±1,3	12,1±0,7	16,7±0,7	12,9±0,5	15,9±0,9	13,7±0,8	16,8±1,6	12,1±0,8	18,8±0,8
Residual nitrogen in serum, g/l	531±9,0	325±14,9	609±23,3	456±58,1	557±15,1	492±14,7	624±6,3	438±18,6	552±18,2	440±21,5	528±17,3	380±29,0
Urea in serum, g/l	367±17,2	203±4,9	371±6,2	199±4,0	367±7,7	242±13,6	184±27,0	244±16,3	296±19,0	227±9,3	297±5,9	198±17,2
Blood glucose, mol/g	2,4±01	3,3±0,1	2,0±0,1	3,1±01	2,0±0,1	3,1±0,1	2,2±0,1	3,1±0,1	2,7±0,2	3,3±0,1	2,1±0,1	3,0±0,2
Ketone bodies in the blood, mol/g	1,4±0,1	1,0±0,1	1,0±0,1	0,7±0,1	1,1±0,1	0,8±0,1	1,2±0,1	0,9±0,2	1,1±0,1	1,0±0,1	1,3±0,1	0,9±0,1
Lipids in serum, g/l	4,1±0,1	5,4±0,1	3,3±0,1	4,6±0,1	3,8±0,1	4,6±0,1	3,8±0,1	6,0±0,1	3,6±0,1	63±0,1	3,7±0,1	6,7±0,3
Lung reserving of blood plasma, l/l	0,55±0,1	0,59±0,1	0,51±0,1	0,54±0,1	0,55±0,1	0,58±0,1	0,51±0,1	0,65±0,1	0,50±0,1	0,61±0,1	0,50±0,1	0,61±0,1

Conclusions

Balancing of rations of cows due to author's premixes which optimize the amino acid trace element and the vitamin composition ositively affects the viability of animals and their production. This is evidenced not only by the results of scientific research, but also by the use of premixes in dairy complexes, farms and in individual state supplies

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index	Physiological condition											
	Before calving		After calving									
			1		3		6		10		20	
	Control	experience	Control	experience	Control	experience	Control	experience	Control	experience	Control	experience
Total protein in serum g/l	74,5±3,4	87,0±2,3	65,0±1,9	82,2±1,9	69,3±1,3	83,2±0,9	70,9±0,7	84,9±1,4	71,0±1,0	86,0±0,8	74,5±2,0	86,06±1,6
Gamma globulins in serum g/l	26,1±1,9	32,±0,8	23,6±1,2	37,6±1,5	21,3±1,3	36,0±1,5	23,6±2,6	34,3±1,5	23,5±2,6	31,71±0,9	20,7±1,1	29,2±0,5
DNA in serum mg/l	3,6±0,5	6,2±0,6	1,8±0,1	3,9±0,3	2,2±0,1	5,3±0,2	4,3±0,3	6,0±0,4	3,9±0,5	7,4±0,5	4,4±0,5	6,9±0,8
RNA in serum mg/l	11,1±0,5	16,1±0,8	9,8±0,7	15,8±1,3	12,1±0,7	16,7±0,7	12,9±0,5	15,9±0,9	13,7±0,8	16,8±1,6	12,1±0,8	18,8±0,8
DNA in serum mg/l	531±9,0	325,0±14,9	609,0±23,3	456,0±58,1	557,0±15,1	492,0±14,7	624,0±6,3	438,0±18,6	552,0±1ë8,2	440,0±21,5	528,0±17,3	380,0±29,0
Urea in	367,0±17,2	203,0±4,9	371,0±6,2	199,0±4,0	367,0±7,7	242,0±13,6	184,0±27,0	244,0±16,3	296,0±19,0	227,0±9,3	297,0±5,9	198,0±17,2

serum mg/l												
Glucose in serum mg/l	2,4±0,1	3,3±0,1	2,0±0,1	3,1±0,1	2,0±0,1	3,1±0,1	2,2±0,1	3,1±0,1	2,7±0,2	3,3±0,1	2,1±0,1	3,0±0,2
Ketone bodies in serum mg/l	1,4±0,1	1,0±0,1	1,0±0,1	0,7±0,1	1,1±0,1	0,8±0,1	1,2±0,1	0,9±0,2	1,1±0,1	1,0±0,1	1,3±0,1	0,9±0,1
Lipids in serum mg/l	4,1±0,1	5,4±0,1	3,3±0,1	4,6±0,1	3,8±0,1	4,6±0,1	3,8±0,1	6,0±0,1	3,6±0,1	6,3±0,1	3,7±0,1	6,7±0,3
Alkaline blood plasma reserve	0,55±0,1	0,59±0,1	0,51±0,1	0,54±0,1	0,58±0,1	0,58±0,1	0,51±0,1	0,65±0,1	0,50±0,1	0,61±0,1	0,50±0,1	0,61±0,1