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МОРФОЛОГІЧНІ ПОКАЗНИКИ КРОВІ МОЛОДНЯКУ ШИНШИЛ ПРИ РІЗНИХ СИСТЕМАХ УТРИМАННЯ

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MORPHOLOGICAL BLOOD PARAMETERS OF YOUNG CHINCHILLAS UNDER DIFFERENT HOUSING SYSTEMS

Анотація.

При вивченні впливу кормових факторів на підвищення продуктивності молодняку шиншил важливе значення мають дослідження морфологічних та біохімічних показників крові. Завдяки своїй рухливості кров є зв'язуючим елементом між усіма органами і тканинами тіла, а хімічні речовини і продукти життєдіяльності різних органів (гормони, ферменти) здійснюють взаємний вплив один на другого також через кров. Рухаючись і пульсуючи по замкнутому колу, вона омиває всі органи і тканини. Тому картина крові є симптоматичним відображенням змін в інтенсивності перебігу усіх обмінних процесів, що проходять в організмі тварин під впливом певних кормових факторів.

Дослідження проводились в умовах віварію на молодняку шиншил в період закладки зимового хутра. З молодняку шиншил було сформовано три дослідні групи, по 4 звірів у кожній.

В результаті досліджень встановлено, що введення до раціону молодняку шиншил нового кормового фактору суттєво не вплинуло на кількісний склад формених елементів крові, кількість гемоглобіну, але сприяло вірогідному підвищенню в другій та третій групах кольорового показника.

На лейкоцитарну формулу препарат особливо не вплинув, лише викликав підвищення кількості еозинофілів та юних форм нейтрофілів у другій групі.

Вміст кальцію, фосфору та лужний резерв залишився без змін. Так само препарат не вплинув і на вміст білка та кількість альбумінів і глобулінів, винятком є третя група, де зафіксовано зниження кількості γ-глобулінів.

Abstract.

When studying the effect of feed factors on the increase of productivity of young chinchillas, it is important

to study the morphological and biochemical parameters of blood. Due to its mobility, blood is a connecting element between all organs and tissues of the body, and chemicals and waste products of various organs (hormones, enzymes) exert mutual influence on each other also through blood. By moving and pulsating in a closed circle, it bathes all organs and tissues. The blood picture is therefore a symptomatic reflection of changes in the intensity of all metabolic processes in the animal body under the influence of certain feed factors.

Studies were conducted under vivarium conditions on young chinchillas during the winter fur laying period. Three experimental groups were formed from young chinchillas, 4 animals in each.

As a result of research it is established that the introduction of a new feed factor into the diet of young chinchillas did not significantly affect the quantitative composition of blood cells, the amount of hemoglobin, but contributed to a probable increase in the second and third groups of color.

The leukocyte formula was not particularly affected by the drug, only caused an increase in the number of eosinophils and young forms of neutrophils in the second group.

The content of calcium, phosphorus and alkaline reserve remained unchanged. Similarly, the drug did not affect the protein content and the amount of albumin and globulins, with the exception of the third group, which recorded a decrease in the number of γ-globulins.

Ключові слова: *шиншила, кров, молодняк тварин, утримання, продуктивність.*
Keywords: *chinchilla, blood, young animals, content, productivity.*

Articulation of issue. All organs, tissues and systems of the body require a constant supply of blood to function properly, as blood performs essential functions for body life: transporting nutrients to cells and carrying metabolic products through them, supplying tissues with oxygen from the lungs and transporting carbon dioxide in the lungs. The blood also has a protective function, maintaining body temperature and homeostasis [2].

When studying the effect of feed factors on the increase of productivity of young chinchillas, it is important to study the morphological and biochemical parameters of blood [8].

Due to its mobility, blood is a connecting element between all organs and tissues of the body, and chemicals and waste products of various organs (hormones, enzymes) exert mutual influence on each other also through blood. By moving and pulsating in a closed circle, it bathes all organs and tissues [3].

The blood picture is therefore a symptomatic reflection of changes in the intensity of all metabolic processes in the animal body under the influence of certain feed factors [9].

It is difficult to identify any process occurring in the body without the direct or indirect influence of normal, physiological microflora. It participates in maintaining homeostasis, stimulates local and systemic immunity, provides colonisation resistance of mucous membranes, plays a key role in antiviral protection [6, 10].

Suppression of intestinal normo-flora leads to disturbances in digestion, absorption of nutrients, vitamin synthesis, production of enzymes and other biologically active substances, absorption of macro- and micronutrients (especially iron, calcium), which are active cofactors of many immune reactions [4, 15].

Blood protein composition depends on the functional state of the organism and its endocrine system, is characterized by the level of protein metabolism and is closely related to biological and physiological properties that determine the nature of resistance, safety and productivity of pigs [7, 16].

The modern technology of livestock production is impossible without providing a complete and balanced feed for the animals. At the same time, no less important is the rational use of feed through the use of bacterial preparations that normalise the microflora of the gastrointestinal tract and improve the digestibility of nutrients in diets [13, 14].

Therefore, the purpose of our work was to study the effect of a symbiotic preparation on the morphological blood parameters of young chinchillas.

The object of the research is young chinchillas gray standard and blood. Subject of research - symbiotic preparation and its theoretical and practical conditions of use.

Research methodology. The research and production experiment was carried out under the conditions of the vivarium of the Department of Livestock Production Technology.

The grey chinchilla standard is the basic colour of chinchillas. The standard is characterised by a grey back, or dark grey with a white belly. The sides have a clear contrast from grey to light grey and to white.

Studies were conducted under vivarium conditions on young chinchillas during the winter fur laying period. Three experimental groups were formed from young chinchillas, 4 animals in each (Table 1).

Table 1

The scheme of the experiment

Groups	Number of animals, h	Feeding characteristics by period	
		equalizing, 15 days	main, 120 days
1 (control)	4	BD*)	BD
2- experimental	4	BD	BD + MikoLad, 1 g / h. per day
3- experimental	4	BD	BD + MikoLad, 3 g / h. per day

BD* – basic diet

Young chinchillas of the control group received feed according to the basic diet. Young chinchillas of the second group received the basic diet feed and the symbiotic preparation MikoLad at the rate of 1 g per 1 animal once a day for 21 days. Young chinchillas of the third group received the basic diet and the preparation at the rate of 3 g per head per day.

The drug was fed as part of the grain mixture once a day. The animals were weighed monthly and kept in groups. At the end of the main period, blood samples were taken from four animals from the tail vein [5]. Morphometric data was processed by Plokhinskyi M.O. [11].

Research results. One of the most important indicators of blood is the number of red blood cells, which make up the bulk of blood cells, and the number of white blood cells, which are white blood cells. The latter are about a thousand times smaller than red blood cells. As can be seen from Table 2, the number of erythrocytes when fed the feed factor decreased slightly in relation to the control group. Thus, in the second group their number decreased by 2.96% and in the third group by 8.38%. There was also a decrease in the number of red blood cells between the study groups. For example, the highest values were in group two where animals were fed 1 g of the preparation per head per day, and these values decreased in group three by 5.59% as the dosage of the preparation increased.

This pattern can be seen when analysing white blood cell count data, with only group two showing an increase of 8.46% compared with the control group, and the remaining groups showing a decrease in white blood cell count - group three by 8.46% compared with the control group. But the change in leucocyte count is not related to the feeding doses. This suggests that supplementation has no effect on the number of form elements and that the changes that do exist between the groups are not significant and are in line with the norm.

Table 2

The content of the cells in the blood of experimental animals. M±m, n=4

Indicator	1 group	2 group	3 group
Erythrocytes, M/mcl	6,08+0,33	5,9+0,27	5,57+0,28
Leukocytes, thousand/mcl	13,0+1,34	14,1+0,39	11,9+1,12

According to the literature, the quantitative composition of the form elements is influenced by age-related changes. Thus, after birth there is a relative increase in erythrocyte content, and with age there is a decrease. Changes in the number of erythrocytes, leukocytes are observed in some diseases.

When analyzing the number of erythrocytes in the blood, attention is paid to the hemoglobin content. The saturation of erythrocytes with haemoglobin, which is a complex protein that allows the blood to perform its primary function of gas transport, is an important indicator that must be monitored [1].

The study showed that there was almost no difference between the first and second groups in haemoglobin content (Table 3). In the third group, the haemoglobin content slightly increased (by 3.82%) in relation to the control group.

Table 3

Haemoglobin content in animal blood. M±m, n=4

Indicator	1 group	2 group	3 group
Amount of haemoglobin, g%	8,65±0,46	8,67±0,5	8,97±0,44
Color indicator	0,9±0,03	0,97±0,07	1,05±0,06
Average haemoglobin content of 1 erythrocyte, μ %	14,2±0,62	14,9±1,15	16,2±1,09

In the third group there was a probable increase in the color index ($P < 0.05$), as well as a tendency to increase it in the second group ($td = 2.23$). Normally it should be equal to one, but in some species it normally fluctuates excessively. It is known that pathological fluctuations should be considered a deviation that is greater by 15-30% in one direction or another [12].

The average content of hemoglobin in one erythrocyte increases compared with the control group, and in the third group this indicator is the highest among the experimental groups (14.08%) compared with the control group, but all these changes are not likely.

According to the literature, the content of erythrocytes and hemoglobin in the blood changes with age. It is also well known that the hemoglobin content depends on the species, age, sex, breed, nature of feeding and other factors. The amount of hemoglobin increases in mountainous conditions, with muscle fatigue and blood clotting (diarrhea, sweating, vomiting, polyuria). Decreased hemoglobin is more common. It is observed in various infectious (infectious anemia) and invasive (piroplasmosis, nutaliosis) diseases, exhaustion, poisoning, bleeding and other diseases accompanied by anemia [1].

The morphological composition of white blood cells is determined by the so-called leukocyte formula. It is a quantitative ratio of individual types of white blood cells, expressed as a percentage.

The number of eosinophils in the blood of animals in the control group exceeds this indicator in the experimental groups. Particularly low number of eosinophils in the second group in relation to the control - 31.6% ($P < 0,001$, table. 4). As the number of eosinophils, the number of basophils in the leukocyte formula exceeds that of the experimental groups, but there is no significant difference between them.

Table 4

Leukocyte formula of blood of experimental animals. M ± m, n = 4

Indicator	1 group	2 group	3 group
Leukogram, % Eosinophils	9,73±0,17	6,65±0,46***	8,78±0,69
Basophils	0,54±0,12	0,43±0,07	0,41±0,07
Neutrophils: Young	1,2±0,12	1,68±0,10*	1,09±0,43
rod-shaped	4,73±0,41	4,58±0,63	5,15±0,37
segmental	32,52±1,17	34,23±0,36	32,25±0,57
Total	38,48±1,46	40,48±0,49	38,49±1,01
L / N	1,22±0,08	1,2±0,02	1,26±0,05
Lymphocyte	46,78±1,12	48,42±0,68	48,63±0,05
Monocyte	4,13±0,43	4,03±0,31	3,7±0,35

Considering the quantitative indicators of neutrophils between the three groups, it should be noted that a probable difference is observed only in the second group for young forms of neutrophils (P <0.05), for other indicators the difference is improbable.

The number of lymphocytes in the experimental groups exceeds the same indicator in the control group by 3.51-4.7%, while between the experimental groups the number of lymphocytes is relatively constant.

Considering the content of monocytes, it should be noted that their number decreases with increasing daily dose of the drug. Thus, the second group contains 2.42% less than the control group, the third - 10.4%.

Due to the fact that the feed additive contains specially selected strains of bacteria that inhibit the growth of pathogenic microorganisms, produce a number of essential amino acids and B vitamins, its effect on blood biochemical parameters has not yet been studied. The effect of the additive on the biochemical parameters of the blood can be seen from the data in table 5.

The calcium content in the second group was at the control level. In the second group its number decreased by 2.11%, while in the third group it increased by 0.84%. But in general its content remains within normal limits. This is very important, because calcium ions are necessary for normal blood circulation, normal heart function, reduced excitability of certain parts of the nervous system [15].

Table 5

Calcium, phosphorus and alkaline blood reserves. M ± m, n = 4

Indicator	1 group	2 group	3 group
Calcium content, mg%	11,85±0,26	11,85±0,26	11,6±0,21
Phosphorus content, mg%	3,72±0,49	3,26±0,05	3,4±0,17
Alkaline reserve, mg%	505±14,5	490±6,67	485±14,54

The presence of phosphorus in the control group exceeds this indicator in all experimental groups by 14.1 and 9.4%, respectively, but between the experimental groups its amount increases with increasing dose of the drug.

Alkaline reserve is of great importance in diagnosis, as this value is relatively easy to change, and its fall signals the impending danger to the general condition of the body. But animals have, when they eat acidic food, a decrease in alkaline reserve, and when alkaline food - an increase.

In this case, the alkaline reserve with increasing dose of the additive decreased. Thus, in the second group the alkaline reserve is 490 mg%, in the third - 480 mg%. Thus, with increasing additive, its value decreased by 2%, but even in the second group, the alkaline reserve was 2.97% lower compared to the control group.

Analysing the protein content in the blood, it should be noted that the total content in the experimental groups is lower compared to the control group, namely: in the second group - by 6.73% and the third - by 1.5% (Table 6).

In terms of albumin content, only the third group outperforms the control group by 3.57%, and the other two groups have a lower rate of 2.98% and 1.67% relative to the control group.

Table 6

The content of protein and its fractions in the blood. M ± m, n = 4

Indicator	1 group	2 group	3 group
The total protein content, g%	7,93±0,43	7,43±0,25	7,81±0,41
Albumins, %	42±1,06	0,75±0,55	43,5±1,11
Globulins, %			
α –	16,5±1,45	19±0,67	18,75±0,55
β –	17,25±0,55	17,25±1,09	18,5±0,75
γ –	24,25±0,55	23±1,49	19,25±0,55***

Globulins α– and β– of the experimental groups exceed the control group, with the exception of only β–globulins of the third group, where their content was lower in relation to the control group by 1.45%. But γ–globulins of the control group exceed the second group by 5.43%, the third - by 25.98% (P <0.001).

Conclusions. 1. The introduction of a new feed factor into the diet of young chinchillas did not significantly affect the quantitative composition of blood cells, the amount of hemoglobin, but contributed to a probable increase in the second and third groups of color.

2. The leukocyte formula was not particularly affected by the drug, only caused an increase in the number of eosinophils and young forms of neutrophils in the second group.

3. The content of calcium, phosphorus and alkaline reserve remained unchanged. Similarly, the drug did not affect the protein content and the amount of albumin and globulins, with the exception of the third group, which recorded a decrease in the number of γ-globulins.

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ФЕНОЛОГІЧНІ ФАЗИ РОЗВИТКУ БУРЯКУ СТОЛОВОГО ЗАЛЕЖНО ВІД СОРТУ ТА ВОДОУТРИМУВАЛЬНИХ ГРАНУЛ

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PHENOLOGICAL PHASES OF DEVELOPMENT OF TABLE BEETS DEPENDING ON THE VARIETY AND WATER-CONTAINING GRANULES

Анотація.

Наведено результати досліджень урожайності сортів буряка столового залежно від внесення водоутримувальних гранул. Спостереження за ростом і розвитком рослин буряку столового показали залежність настання фаз росту та розвитку в часі від сортових особливостей та застосування суперабсорбентів. Фазу линьки коренеплоду відмічали на 1 добу раніше на варіанта із застосуванням водоутримуючих гранул. Тривалість міжфазних періодів буряку столового свідчить проте, що на них впливали досліджувані сорти та застосування водоутримуючих гранул. Період масові сходи – початок інтенсивного формування коренеплоду коротшим був на варіантах із застосуванням водоутримуючих гранул: у сорту Бордо Харківський – 27 діб, у сорту Опольський – 29 діб, що на 4 та 3 доби відповідно коротші порівняно з варіантами без гранул. Період від масових сходів до закінчення вегетації менш тривалим був на варіантах