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ВЕСТНИК

НАЦИОНАЛЬНОЙ АКАДЕМИИ НАУК
РЕСПУБЛИКИ КАЗАХСТАН

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NAS RK is pleased to announce that Bulletin of NAS RK scientific journal has been accepted for indexing in the Emerging Sources Citation Index, a new edition of Web of Science. Content in this index is under consideration by Clarivate Analytics to be accepted in the Science Citation Index Expanded, the Social Sciences Citation Index, and the Arts & Humanities Citation Index. The quality and depth of content Web of Science offers to researchers, authors, publishers, and institutions sets it apart from other research databases. The inclusion of Bulletin of NAS RK in the Emerging Sources Citation Index demonstrates our dedication to providing the most relevant and influential multidiscipline content to our community.

Қазақстан Республикасы Ұлттық ғылым академиясы "ҚР ҰҒА Хабаршысы" ғылыми журналының Web of Science-тің жаңаланған нұсқасы Emerging Sources Citation Index-те индекстелуге қабылданғанын хабарлайды. Бұл индекстелу барысында Clarivate Analytics компаниясы журналды одан әрі the Science Citation Index Expanded, the Social Sciences Citation Index және the Arts & Humanities Citation Index-ке қабылдау мәселесін қарастыруда. Web of Science зерттеушілер, авторлар, баспашылар мен мекемелерге контент тереңдігі мен сапасын ұсынады. ҚР ҰҒА Хабаршысының Emerging Sources Citation Index-ке енуі біздің қоғамдастық үшін ең өзекті және беделді мультидисциплинарлы контентке адалдығымызды білдіреді.

НАН РК сообщает, что научный журнал «Вестник НАН РК» был принят для индексирования в Emerging Sources Citation Index, обновленной версии Web of Science. Содержание в этом индексировании находится в стадии рассмотрения компанией Clarivate Analytics для дальнейшего принятия журнала в the Science Citation Index Expanded, the Social Sciences Citation Index и the Arts & Humanities Citation Index. Web of Science предлагает качество и глубину контента для исследователей, авторов, издателей и учреждений. Включение Вестника НАН РК в Emerging Sources Citation Index демонстрирует нашу приверженность к наиболее актуальному и влиятельному мультидисциплинарному контенту для нашего сообщества.

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BIRD BIOPOTENTIAL AGAINST THE CORRECTION OF NON-SPECIFIC RESISTANCE AND SPECIFIC IMMUNOGENESIS

Abstract. For the first time in the conditions of commercial poultry production of the Chuvash Republic, a system for realizing the bioresource potential of productive traits of meat and egg-laying chicken of Lohmann Brown variety was introduced, which provides for the activation of nonspecific resistance and specific immunogenesis of the body with the immunotropic drug PV-1, developed by scientists of the Chuvash State Agricultural Academy. It is scientifically grounded and experimentally proved that feeding chickens of the 1st, 2nd and 3rd experimental groups with the drug PV-1 at doses of 0.05 ml/kg, 0.10 ml/kg and 0.15 ml/kg of live weight, respectively, once a day for 10 days with a 10-day break, with the repetition of cycles up to their 111-day age, stimulates the growth and development of young birds. On the 110th day of scientific and economic tests, the young birds of the experimental groups exceeded in the live weight of peers in the control group by 5.4%, 7.1% and 10.1% (P<0.01-0.001), respectively. The dynamics of changes in the absolute and average daily gain in live weight of tested young birds depended on the dose of the drug, and the maximum efficiency was established at a dose of 0.15 ml per 1 kg of live weight. It was found that the use of the PV-1 contributes to an increase in erythropoiesis, leukopoiesis and protein metabolism, as well as immunobiological indicators of the hematological profile of nonspecific resistance of the bird organism from 60 days of age (P<0.01-0.001). An increase in the number of red blood cells and the concentration of hemoglobin in the blood of tested birds on the background of immunocorrection show an improvement in their hematopoiesis, and an increase in the number of leukocytes indicates the activation of cellular protective factors of the body. The total protein content in the experimental groups enhanced due to an increase in the number of albumin and gamma globulins. The activation of nonspecific resistance of the bird organism against the use of the PV-1 immunostimulating drug was established according to the parameters of phagocytic activity of leukocytes, phagocytic index, lysozyme and bactericidal activity of blood serum. Immunization of birds with the use of the immunotropic drug PV-1 is accompanied by immunity stress: at Gumboro disease vaccination of chickens, the titers of specific antibodies increases by 53.3%, at Newcastle disease vaccination - by 50.0%, and at egg drop syndrome (EDS -76) vaccination - by 26.5 % If the egg production of the initial laying hen for 68 weeks of life in the control group was 196, then in the first experimental group it was 9.2% more, in the second experimental group - 9.7% more, in the third experimental group - 17.8% more. Based on the average laying hen, egg production in the experimental groups was higher than in the control: in the 1st experimental - by 4.1%, in the 2nd experimental - by 5.4% and in the 3rd experimental - by 11.8%. Laying hens of the control group reached 50% egg-laying at the age of 158 days, in the 1st and 2nd experimental groups - at 152 days of age, in the 3rd experimental group - at 155 days of age. The climax of the egg-laying capacity of the laying hens of the tested groups was at the 6th month of egg-laying: in the control group at 199 days of age, the 1st experimental group at 192 days of age, in the 2nd experimental group at the age of 200 days, and in the 3rd experimental group at 183 days of age. Against the background of the intensification of immunogenesis and nonspecific resistance of the body to the pressure of environmental and technological stress factors of habitat, the safety of the bird increases. The safety for 4 weeks of growth was 98.3% in the control group, 98.3% in the 1st experimental group, and 100% in the 2nd and 3rd experimental groups. A study of the meat productivity of birds raised with the use of the PV-1 revealed an increase in slaughter yield by 1.7 - 5.0%, the yield

of edible parts increased by 62±3.20 - 155±3.40 g (P<0.001). To actualize productivity, to enhance non-specific resistance and ensure bird safety, we recommend using the PV-1 immunostimulating drug at a dose of 0.15 ml per 1 kg of live weight by feeding with fodder once a day for 10 days with a 10-day break. To increase immunity against Gumboro, Newcastle and SSN-76 diseases, we recommend using the PV-1 at a dose of 0.1-0.15 ml per 1 kg of live weight by feeding with fodder 10-12 days before immunization.

Keywords: chickens, young birds, laying hens, the immunotropic drug PV-1, nonspecific and specific resistance, egg-laying and meat productivity.

Introduction. In providing the population with quality foodstuff, a special place is given to poultry farming enabled to solve this problem in a short time and at the lowest cost. However, it should be remembered that further development and increasing the competitiveness of poultry farming is possible only with a large-scale introduction of innovative resource-saving technologies and equipment that maximize the genetic potential of bird productivity [1-6].

In conditions of industrial poultry farming, to achieve high productivity, preservation and obtaining biologically fully-featured and good products is sometimes very problematic due to the pressure of environmental and technological habitat factors, which negatively affects the physiological state of the body. Under the influence of these adverse factors, nonspecific resistance and immunological reactivity of a bird often decrease. Damage to the immune system leads to an immunodeficiency state and a weakening of the body's resistance to pathogens of infectious diseases [7, 8]**.**

The use of antibiotics and chemotherapeutic agents for the prevention and treatment of bird diseases often results in disruption of normal microflora, the emergence of resistant strains of agents and a decrease in immune status. Creating healthy livestock through the introduction of scientific and technological achievements and best practices will further increase bird productivity [9-11].

In the context of the above-mentioned, the problem of restoration of immunological disorders using immunostimulants is currently relevant for modern science and practice, since most diseases are accompanied by secondary immunological deficiency [12].

The studies were carried out as part of the international cooperation of agrarian scientists from Kazakhstan and the Russian Federation for 2018-2020.

The aim of this work is to realize the bird’s biopotential by correcting nonspecific resistance and specific immunogenesis of the body.

Material and methods of research. The experimental part of the research was carried out at one of the poultry plants of the Chuvash Republic, and the processing of materials was carried out in the laboratories of the Chuvash State Agricultural Academy. The objects of research were the clinically healthy egg-laying birds of the autosex cross "Lohmann brown." The research was conducted according to a proven research design [13].

Four groups of day-old chickens were formed, 60 birds each, according to the principle of groups-analogs. Chickens of the 1st experimental group were fed with an immunostimulant PV-1 at a dose of 0.05 ml/kg of live weight, of the 2nd experimental group - 0.10 ml/kg and of the 3rd experimental group - 0.15 ml/kg of body weight. The PV-1 preparation was given with food once a day for 10 days with a 10-day break repeatedly up to 111 days of bird's age. The control group of chickens did not receive the preparation. Young experimental birds up to 111 days of age were kept in the breeding workshop and then transferred to the keeping workshop for the maintenance of laying hens of the parent stock. The conditions for housing, feeding, and caring were the same for all groups of birds.

Research results and discussion. It was established that in day-old chickens of the experimental and control groups, the live weight parameters have had no significant differences. However, on the 30th day chickens of the experimental group exceeded peers in the control group in this parameter. So, the live weight of chickens of the 1st experimental group was higher by 1.5%, of the 2nd - by 2.5% and of the 3rd - by 4.5% (P<0.01). Subsequently, the birds of the experimental groups grew and developed better than the young birds of the control group. On the 110th day, the live weight of young birds of the 1st, 2nd and 3rd experimental groups exceeded by 5.4%, 7.1%, and 10.1% compared with the control (P<0.01-0.001) respectively.

Analyzing the average daily gains in live weight in birds, it is necessary to point out that they were the same weight gain dynamics (table 1).

Table 1 – Dynamics of the average daily gain in young birds

Bird's age, days	Control group	1 experimental	2 experimental	3 experimental
10	4.0±0.3	3.9±0.25	3.9±0.27	4.0±0.6
30	6.3±0.4	7.6±0.21**	7.7±0.35**	8.0±0.25***
60	11.8±0.5	12.8±0.6	13.2±0.4*	13.6±0.5**
90	14.0±0.3	15.1±0.5	15.2±0.6	15.7±0.4**
110	13.1±1.1	13.7±0.9	13.9±0.6	14.4±0.7
*P ≤ 0.05, **P ≤ 0.01, ***P ≤ 0.001.				

The dynamics of changes in the absolute and average daily gain in live weight of young birds of the experimental groups depended on the dose of the preparation. Maximum efficiency was established when using this immunostimulant at a dose of 0.15 ml per 1 kg of live weight.

The hematological profile of birds is presented in table 2.

Table 2 – Hematological profile of birds

Bird's age, days	Control group	1 experimental	2 experimental	3 experimental
Red blood cell count, 10^{12}/l				
30	2.94±0.14	3.22±0.51	3.36±0.4	3.42±0.2
60	2.89±0.15	3.20±0.34	3.29±0.29	3.39±0.41*
110	2.98±0.13	3.44±0.32	3.52±0.26	3.64±0.17**
150	3.39±0.16	3.47±0.24	3.47±0.23	3.49±0.19
Hemoglobin, mg/%				
30	8.2±1.3	9.27±1.6	9.49±1.4	9.85±1.3
60	8.58±1.6	9.40±1.2	9.52±1.2	9.67±1.5
110	9.94±0.9	10.14±1.1	10.49±0.9	11.09±1.0
150	10.1±0.8	10.5±0.9	10.82±1.0	10.9±0.9
White blood cell count, 10^{9}/l				
30	20.42±1.2	21.33±1.7	21.20±1.1	21.03±1.2
60	26.50±1.4	27.9±1.2	28.00±1.3	28.27±1.4
110	28.67±1.3	33.07±1.7*	33.87±1.6*	34.60±1.3**
150	33.43±2.1	34.00±2.1	34.10±2.3	34.35±2.5
*P ≤ 0.05, **P ≤ 0.01, ***P ≤ 0.001.				

It was found that the application of the PV-1 immunostimulant contributed to an increase in the number of red blood cells in blood of birds of the 1st experimental group by 9.5-15.4% (P>0.05), of the 2nd - by 13.8-18.1% (P>0.05) and of the 3rd experimental group - by 16.3-22.1% (P<0.05-0.01) compared with the control. The hemoglobin content in the blood of the chickens of the experimental groups was also higher than in the control: in the first experimental group - by 2.0-13.1%, in the second group - by 5.5-15.7% and in the third group - by 7.9-20.1% (P<0.05). The number of leukocytes in birds increased with age, which is associated with the formation of the functional activity of the blood-forming organs and the immune system. In the birds of the experimental groups, the leukocyte content at 30-, 60- and 110-day-old age was higher than in the control: in the 1st experimental - by 4.5-15.3% (P<0.05), in the 2nd group - by 3.8-18.1% (P<0.05) and in the 3rd experimental group - by 3.0% (P>0.05) - 20.7% (P<0.01). An increase in the number of red blood cells and the hemoglobin content in the blood of birds of the experimental groups against the background of immunocorrection indicate an improvement in their hematopoiesis, and an increase in the number of leukocytes indicates the activation of cellular protective factors of the body.

Biochemical studies of blood serum revealed some fluctuations in protein metabolism (table 3).

Table 3 – Biochemical blood indicators of birds

Group	Age, days	Total protein, g/l	albumins, g/l	Gamma globulins, g/l
Control	60 90 110 280	49.6±1.2 55.6±1.0 55.2±0.9 53.4±1.4	16.8±0.22 18.9±0.32 18.8±0.21 18.1±0.35	17.8±0.26 20.0±0.24 19.8±0.32 19.2±0.18
1 experimental	60 90 110 280	51.6±0.8 57.5±1.3 57.8±1.4 55.6±1.0	17.6±0.56 19.8±0.52 19.5±0.24 18.4±0.25	18.6±0.21 20.6±0.24 21.6±0.26 20.6±0.27
2 experimental	60 90 110 280	51.8±1.0 58.3±1.0* 58.7±1.2* 57.0±0.8*	18.5±0.25 19.4±0.41* 20.4±0.52* 19.2±0.22*	18.1±0.26 22.1±0.24** 20.8±0.31** 20.7±0.21*
3 experimental	60 90 110 280	52.3±1.1 60.2±1.0* 61.4±1.3** 58.0±1.3*	17.6±0.35* 20.3±0.36* 20.4±0.41* 19.8±0.33*	19.5±0.16** 23.3±0.24*** 23.5±0.32*** 21.6±0.17***
*P ≤ 0.05, **P ≤ 0.01, ***P≤ 0.001.				

The highest level of total protein and its fractions was detected at 90 days of age. Apparently, at this age, the formation of protein metabolism in young animals occurs to the level of an adult bird, and in the future - stabilization of this metabolism. It should be noted that the total protein content in birds of the 1st experimental group was higher than in the control birds by 3.4-4.7% (P>0.05), of the 2nd - by 4.4-6.7% (P<0.05) and of the 3rd experimental - by 5.4-11.2% (P<0.05-0.01). The total protein content in the experimental groups increased due to an expansion in the number of albumin and gamma globulins.

The study of blood immunological indicators (table 4) showed that the phagocytic activity of leukocytes increases with the bird's age. In young experimental groups at 60 days of age, this indicator was higher compared to the control, in the 1st experimental group - higher by 9.8%, in the 2nd group - by 18.2% and in the 3rd group - by 20.4 % (P<0.05-0.01), at the age of 90 days - by 2.6%, 6.8 and 7.2% (P<0.05), at the age of 110 days - by 14.6%, 20.5%, 29.5% (P<0.05-0.001), respectively. The absorption capacity of pseudo-eosinophils varied. In the 2nd and 3rd experimental groups, the phagocytic index was 1.7–11.7% higher (P<0.05–0.01) than in the control.

Table 4 – Dynamics of immunological indicators of birds

Group	Age, days	Phagocytic activity, %	Phagocytic index	Lysozyme activity, %	Bactericidal activity, %
Control	60 90 110	22.5±1.2 26.5±0.9 34.2±1.6	1.62±0.08 1.78±0.09 1.79±0.05	25.3±1.0 38.9±1.2 42.9±1.0	49.8±1.1 52.3±1.2 54.7±1.1
1 experimental	60 90 110	24.7±1.0 27.2±1.1 39.2±1.3*	1.72±0.06 1.81±0.04 1.80±0.08	32.8±2.2** 45.0±1.6** 48.8±1.3**	55.6±1.2** 56.3±1.1* 58.0±0.9*
2 experimental	60 90 110	26.6±1.3* 28.3±1.4 41.2±1.9**	1.78±0.1* 1.86±0.12 1.82±0.09	36.9±3.2** 51.4±0.5** 53.1±2.3**	57.7±1.85** 58.1±0.8** 60.7±0.6**
3 experimental	60 90 110	27.1±1.4** 28.4±0.9* 44.3±1.3***	1.81±0.06* 1.82±0.1* 1.86±0.11*	37.2±1.8** 54.1±2.9*** 57.9±2.4***	57.7±1.4** 58.8±1.1** 61.6±1.0**
*P ≤ 0.05, **P ≤ 0.01, ***P ≤ 0.001.					

The lysozyme activity of the blood serum of birds in the 1st, 2nd and 3rd experimental groups throughout the entire study period was higher than in the control: at 60 days of age - by 29.6%, 45.8% and 47.0% , in the 90-day - by 15.7%, 32.1% and 39.0%, in the 110-day - by 13.7%, 23.8% and 35% (P<0.01-0.001), respectively.

The bactericidal activity of the blood serum of birds in the 1st, 2nd and 3rd experimental group was also higher than in the control: at 60 days of age - by 11.6%, 15.9% and 15.8%, at 90 days of age - by 7.6%, 11.1% and 12.4%, at 110 days of age - by 6.0%, 11.0% and 12.6% (P<0.05-0.01), respectively.

Thus, the use of the PV-1 immunostimulant in growing chickens contributed to the improvement in erythropoiesis, leukopoiesis and protein metabolism, as well as an increase in the immunological indicators of young birds.

We have studied the effect of the PV-1 on the characteristics of immune development at vaccination of birds against Gumboro disease, Newcastle disease, and Egg drop syndrome -76.

Immunization of chickens against Gumboro disease led to the maximum accumulation of titer of specific antibodies 30 days after the vaccination (table 5).

Table 5 – Accumulation of titer of antibodies against Gumboro disease

Group	The average titer of antibodies (in EIA units), after (days)					
	30		60		90	
	indicator	% to the control	indicator	% to the control	indicator	% to the control
Control	6306	100	3257	100	2257	100
1 experimental	6420	101.8	3171	97.3	3040	134.7
2 experimental	7205	114.2	4919	151.0	4822	212.7
3 experimental	9671	153.3	5395	165.6	5211	229.9

In the experimental groups, antibody titers were higher than in the control: in the 1st experimental group - by 1.8%, in the 2nd - by 14.2% and in the 3rd - by 53.3%. In the subsequent periods of studies, the titer of specific antibodies decreased in all experimental groups: on the 60th day after vaccination - lower by 31.7-50.6%, on the 120th day - by 33.1-64.2%. It should be noted that the antibodies titers against Gumboro disease with the use of the PV-1 immunostimulant in all experimental groups remained up to 120 days at the level of 47.4-66.9%, and in the control group, antibody titers decreased by 2.8 times.

The maximum accumulation of specific virus-neutralizing antibodies against Newcastle disease was observed 60 days after the vaccination of birds (table 6).

Table 6 – Dynamics of antibody titer against Newcastle disease

Days after vaccination	Groups of birds			
	Control	1 experimental	2 experimental	3 experimental
	the average antibody titer in Ig2			
30	4.5/100	5.0/111.1	6.0/133.3	6.75/150.0
60	5.4/100	7.1/131.5	7.5/138.9	8.1/150.0
90	5.0/100	6.0/120.0	6.5/130.0	7.4/148.0
120	4.6/100	5.8/126.1	6.4/139.1	6.7/145.6
160	3.4/100	5.0/147.0	5.5/161.8	5.4/158.8
190	3.2/100	4.0/125.0	4.5/140.6	4.7/146.9
250	3.2/100	3.3/103.1	3.9/121.9	4.3/134.4
360	4.7/100	4.8/102.1	5.8/123.4	5.6/119.1
A numerator is the average antibody titer in Ig2; a denominator is a percent compared to the control.				

In the 1st experimental group, antibody titers were higher by 31.5% compared with the control, in the 2nd experimental - by 38.9%, in the 3rd experimental - by 50.0%. By the 90th day, the level of antibodies gradually decreased in all experimental groups. But in the experimental groups, antibody titers were higher than in the control: in the 1st experimental one - by 20.0%, in the 2nd one - by 30.0%, in the 3rd one - by 48.0%. The use of the PV-1 immunostimulant contributed to maintaining the titer of virus-neutralizing antibodies at a high level up to 160 days after immunization, while in birds of the control group it decreased markedly from the 90th day after the vaccination.

Immunization of young birds against EDS-76 disease with the use of the PV-1 led to an increase in antibody titer in the first experimental group by 17.8%, in the second one - by 24.3, in the third one - by 26.5% compared with the control group. On the 100th, 170th and 270th days after the vaccination, the titer of virus-neutralizing antibodies in the control group of birds gradually decreased. But in the experimental groups, it was high, especially when using the PV-1 at a dose of 0.15 ml per 1 kg of live weight of the bird.

Consequently, the use of the PV-1 immunostimulant promotes an increase in immunity during vaccination of birds against Gumboro, Newcastle and EDS-76 diseases. Moreover, the duration of preservation of specific virus-neutralizing antibodies increased compared with birds of the control group.

It was established that if the egg-laying capacity of housed egg-laying bird for 68 weeks of life in the control group amounted to 196 pieces, then in the first experimental group it was 9.2% more, in the second experimental group - 9.7% more, in the 3rd experimental - 17.8% more.

Based on the average laying bird, egg production in the control group was 220 pieces. In the experimental groups, it was higher than in the control: in the 1st experimental group - by 4.1%, in the 2nd - by 5.4% and in the 3rd - by 11.8%. Laying birds of the control group reached 50% oviposition at the age of 158 days, the 1st and 2nd experimental groups - at the age of 152 days, the 3rd experimental - at the age of 155 days. The highest egg-laying capacity of the laying hens of the experimental groups was on the 6th month of egg-laying: in the control group - at 199 days of age, in the 1st experimental group - at 192 days of age, in the 2nd experimental group - at 200 days of age, and the 3rd experimental group - at 183 days of age.

One of the important indicators in the practice of industrial poultry farming is the mass of eggs. The egg mass at the beginning of the productive period was low and amounted to 52.3 ± 0.2 g in birds of the control group. In the first experimental group, it was higher by 0.5%, in the second - by 1.3% ($P<0.05$), in the 3rd - by 4.6% ($P<0.01$) than in the control. At the height of oviposition, the egg mass was higher and amounted to 56.8 ± 0.13 g in the control group, 57.1 ± 0.2 g in the first experimental group, and 57.8 ± 0.2 g in the second group ($P<0.05$), in the 3rd experimental one - 58.1 ± 0.21 g ($P<0.01$). It was revealed that the eggs of young chickens contain more protein (58.5-59.6%) and less yolk (26.3-27.1%) than eggs in older chickens (57.6-58.1% and 28.3-28.5%, respectively). The use of the drug PV-1 influenced the egg protein mass in the initial period of egg production, i.e. it increased ($P<0.01$). The mass of yolk in the context of experimental groups of birds did not differ significantly.

The preservation of bird for 4 weeks of growing was 98.3% in the control group, 98.3% in the 1st experimental group, and 100% in the 2nd and 3rd experimental groups. The preservation of birds from the 5th to the 16th week in the control group was 86.6%, in the 1st experimental group - 96.6%, in the 2nd and 3rd experimental groups - 99.8%. Apparently, this is because the PV-1 contributes to an increase in nonspecific resistance of the bird organism and resistance to the action of adverse environmental factors.

A study of the meat productivity of birds grown using the PV-1 immunostimulant showed an increase in slaughter yield of 1.7 - 5.0%, the yield of edible parts increased in the experimental groups from 62 ± 3.2 g to 155 ± 3.4 g ($P<0.001$).

Conclusion. To increase the productivity, nonspecific resistance and safety of the bird, we recommend using the PV-1 immunostimulating drug at a dose of 0.15 ml per 1 kg of live weight by feeding with fodder once a day for 10 days with a 10-day break.

To enhance the antibody titer at vaccination of birds against diseases of Gumboro, Newcastle, and EDS-76, we recommend using the immunostimulant PV-1 at a dose of 0.1-0.15 ml per 1 kg of live weight by feeding with food 10-12 days before the immunization.

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СПЕЦИФИКАЛЫҚ ЕМЕС ТӨЗІМДІЛІКТІ ЖӘНЕ СПЕЦИФИКАЛЫҚ ИММУНОГЕНЕЗДІ ТҮЗЕТУ АЯСЫНДА ҚҰСТЫҢ БИОӘЛЕУЕТІ

Аннотация. Чуваш Республикасының өнеркәсіптік құс шаруашылығы жағдайында алғаш рет Чуваш мемлекеттік ауыл шаруашылығы академиясының ғалымдары әзірлеген PV-1 иммунотропиялық препаратымен тән емес резистенттілікті және организмнің спецификалық иммуногенезін жандандыруды көздейтін "Ломанн қоңыр" кроссының ет-жұмыртқа бағытындағы құстың өнімділік сапасының биоресурстық әлеуетін іске асыру жүйесі енгізілді. PV-1 препаратының 1-ші, 2-ші және 3-ші тәжірибелік топтарының балапандарын тиісінше 0,05 мл/кг, дене салмағының 0,10 және 0,15 мл/кг дозаларында 10 тәулік ішінде тәулігіне бір рет 10 тәуліктік үзіліспен, олардың 111 тәуліктік жасына дейінгі циклдерін қайталай отырып, қоректендіруі төлдің өсуі мен дамуын ынталандыратыны ғылыми негізделген және эксперименталды дәлелденген. Ғылыми-шаруашылық тәжірибенің 110-шы тәулігіне тәжірибелі топтардың жас құстарының тірі салмағы бойынша бақылауда тиісінше 5,4 %, 7,1 және 10,1 % (P<0,01-0,001) асып түсті. Тәжірибелік топтағы құс төлдерінің тірі салмағының абсолюттік және орташа тәуліктік өсуінің өзгеру динамикасы препараттың дозасына байланысты және ең жоғары тиімділігі 1 кг тірі салмаққа 0,15 мл дозада белгіленген. PV-1 препаратын қолдану эритропоэздің, лейкопоэздің және ақуыз алмасуының көрсеткіштерін, сондай-ақ олардың 60 тәуліктік жасынан (P<0,01-0,001) құс организмінің спецификалық емес резистенттілігінің гематологиялық бейінінің иммунобиологиялық көрсеткіштерін арттыруға ықпал ететіні анықталды. Иммунокоррекция аясында тәжірибелі топтардың құстардың қанындағы эритроциттер санының және гемоглобин концентрациясының артуы оларда гемопоэздің жақсарғанын, ал лейкоциттер санының артуы – организмнің жасушалық қорғаныш факторларының белсенділігін көрсетеді. Тәжірибелі топтарда жалпы ақуыз мөлшері альбуминдер мен гаммаглобулиндер санының артуы есебінен артты. PV-1 иммуностимуляторын қолдану аясында құстар ағзасының спецификалық емес резистенттілігін жандандыру көрсеткіштер бойынша белгіленген: лейкоциттердің фагоцитарлық белсенділігі, фагоцитарлық индекс, қан сарысуының лизоцимді және бактерицидті белсенділігі. PV-1 иммунотропиялық препаратын қолдану аясында құстарды иммундау иммунитет қауырттылығының жоғарылауымен бірге жүреді: балапандарды Гамборо ауруына қарсы вакцинациялау кезінде ерекше антиденелердің титрасы 53,3%-ға, Ньюкасл ауруына қарсы 50,0%-ға және ССК – 76 26,5%-ға көтеріледі. Егер бастапқы ұшаға жұмыртқалаушылық бақылау тобында 68 апта ішінде 196 дананы құраса, 1-ші тәжірибелі топта ол 9,2%-ға, 2-ші тәжірибелі топта – 9,7%-ға, 3-ші тәжірибелі топта-17,8%-ға артық болды. Тәжірибелі топтарда жұмыртқалағыштықтың орташа жұмыртқалағыш есебінде ол бақылауға қарағанда жоғары болды: 1-ші тәжірибелік кезеңде – 4,1%-ға, 2 – ші кезеңде – 5,4%-ға және 3-ші кезеңде-11,8%-ға өсті. Бақылау тобының тауықтар-мекиендері 158 күн, 1-ші және 2-ші тәжірибелі топтар – 152 күн, 3-ші тәжірибелі топтар – 155 күн жасында 50% жұмыртқалауға жетті. Тәжірибе асты топтарының тауықтың жұмыртқалау жоғарғы нүктесі жұмыртқалаудың 6 айында жетті: бақылау тобында-199 күндік, 1-ші тәжірибелі топта-192 күндік, 2-ші тәжірибелі топта – 200 күндік, 3-ші тәжірибелі топта-183 күндік жаста. Иммуногенездің белсенділігі және ағзаның экологиялық-технологиялық стресс-факторларының прессингіне тән емес резистенттілігі аясында құстың сақталуы артады. Өсірудің 4 аптасында құстың сақталуы бақылау тобында 98,3%, 1 тәжірибелік топта-98,3%, 2 және 3 Тәжірибелік топта – 100% құрады. PV-1 препаратын қолдану аясында өсірілген құстардың ет өнімділігін зерттеумен союдың 1,7–5,0%-ға көтерілуі анықталды, жеуге жарамды бөліктердің шығуы 62±3,20-155±3,40 г (P<0,001) ұлғайды. Өнімділікті іске асыру, спецификалық емес резистенттілікті жандандыру және құстың сақталуын қамтамасыз ету үшін 10 күндік үзіліспен 10 күн ішінде тәулігіне бір рет азықпен қоректендіру жолымен тірі салмағына 1 кг 0,15 мл дозада PV-1 иммуностимуляторын пайдалануды ұсынамыз. Иммунитет кернеулігін арттыру үшін құстарды Гамборо, Ньюкасл және Ся-76 ауруларына қарсы вакцинациялау кезінде иммуностимуляторды иммундауға дейін 10-12 күн бұрын азықпен қоректендіру жолымен тірі салмағына 1 кг 0,1-0,15 мл дозада пайдалану ұсынылады.

Түйін сөздер: балапандар, жас балапандар, мекиен тауықтар, PV-1 иммунотропды препараты, спецификалық емес және спецификалық төзімділігі, жұмыртқа және ет өнімділігі.

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БИОПОТЕНЦИАЛ ПТИЦЫ НА ФОНЕ КОРРЕКЦИИ НЕСПЕЦИФИЧЕСКОЙ РЕЗИСТЕНТНОСТИ И СПЕЦИФИЧЕСКОГО ИММУНОГЕНЕЗА

Аннотация. Впервые в условиях промышленного птицеводства Чувашской Республики внедрена система реализации биоресурсного потенциала продуктивных качеств птицы мясо-яичного направления кросса «Ломанн коричневый», предусматривающая активизацию неспецифической резистентности и специфического иммуногенеза организма иммунотропным препаратом PV-1, разработанным учеными Чувашской государственной сельскохозяйственной академии. Научно обосновано и экспериментально доказано, что скармливание цыплятам 1-й, 2-й и 3-й опытных групп препарата PV-1 в дозах соответственно по 0,05 мл/кг, 0,10 и 0,15 мл/кг массы тела один раз в сутки в течение 10 суток с 10-суточным перерывом, с повторением циклов до 111-суточного их возраста стимулирует рост и развитие молодняка. На 110-е сутки научно-хозяйственного опыта молодняк птиц опытных групп превосходил по живой массе сверстников в контроле на 5,4 %, 7,1 и 10,1 % (P<0,01-0,001) соответственно. Динамика изменений абсолютного и среднесуточного прироста живой массы молодняка птиц опытных групп зависела от дозы препарата, и максимальная эффективность установлена в дозе 0,15 мл на 1 кг живой массы. Установлено, что применение препарата PV-1 способствует повышению показателей эритропоэза, лейкопоэза и белкового обмена, а также иммунобиологических показателей гематологического профиля неспецифической резистентности организма птиц с 60-суточного их возраста (P<0,01-0,001). Увеличение количества эритроцитов и концентрации гемоглобина в крови птиц опытных групп на фоне иммунокоррекции свидетельствует об улучшении у них гемопоэза, а повышение числа лейкоцитов – об активизации клеточных защитных факторов организма. Содержание общего белка в опытных группах повышалось за счет увеличения количества альбуминов и гамма-глобулинов. Активизация неспецифической резистентности организма птиц на фоне применения иммуностимулятора PV-1 установлена по показателям: фагоцитарная активность лейкоцитов, фагоцитарный индекс, лизоцимная и бактерициданя активность сыворотки крови. Иммунизация птицы на фоне применения иммунотропного препарата PV-1 сопровождается повышением напряженности иммунитета: при вакцинации цыплят против болезни Гамборо повышаются титры специфических антител на 53,3 %, против болезни Ньюкасла – на 50,0 % и против ССЯ-76 – на 26,5 %. Если яйценоскость на начальную несушку за 68 недель жизни в контрольной группе составила 196 штук, то в 1-ой опытной группе она была больше на 9,2%, во 2-ой опытной – на 9,7%, в 3-й опытной – 17,8%. В расчете на среднюю несушку яйценоскость в опытных группах она была выше, чем в контроле: в 1-й опытной – на 4,1%, во 2-й – на 5,4% и в 3-й – на 11,8%. Куры-несушки контрольной группы достигли 50%-ной яйцекладки в возрасте 158 дней, 1-й и 2-й опытных групп – 152 дня, 3-й опытной – 155 дней. Пик яйценоскости куры-несушки подопытных групп достигли на 6-м месяце яйцекладки: контрольной группы – в 199-дневном возрасте, 1-й опытной группы – в 192-дневном, 2-й опытной – 200-дневном, 3-й опытной – в 183-дневном возрасте. На фоне активизации иммуногенеза и неспецифической резистентности организма к прессингу эколого-технологических стресс-факторов среды обитания повышается сохранность птицы. Сохранность птицы за 4 недели выращивания составила в контрольной группе 98,3%, 1-й опытной – 98,3%, во 2-й и 3-й опытных группах – 100%. Изучением мясной продуктивности птиц, выращенных на фоне применения препарата **PV**-1, установлено повышение убойного выхода на 1,7 – 5,0%, выход съедобных частей увеличился на 62±3,20 – 155±3,40 г (P<0,001). Для реализации продуктивности, активизации неспецифической резистентности и обеспечения сохранности птицы рекомендуем использовать иммуностимулятор PV-1 в дозе 0,15 мл на 1 кг живой массы путем скармливания с кормом один раз в сутки в течение 10 дней с 10-дневным перерывом. Для повышения напряженности иммунитета при вакцинации птицы против болезней Гамборо, Ньюкасла и ССЯ-76 рекомендуем использовать иммуностимулятор PV-1 в дозе 0,1-0,15 мл на 1 кг живой массы путем скармливания с кормом за 10-12 дней до иммунизации.

Ключевые слова: цыплята, молодняк, куры-несушки, иммунотропный препарат PV-1, неспецифическая и специфическая резистентность, яичная и мясная продуктивность.

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