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The Technology Of Growing Poultry Using The Poly-Enzyme Preparation «Universal».

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ABSTRACT

In the conditions of intensive poultry farming it is of great importance to control the physiological condition and development of young animals, forecasting the productivity of birds. The aim of our research was to study the influence of the domestic multi-enzyme preparation "Universal" on the quantitative indicators of chickens, turkeys and ducklings in the production of poultry meat. Scientific and economic experiments were conducted on the basis of the leading poultry complexes of the Republic of Tatarstan of the Russian Federation. In laboratory studies in rats found that the enzyme preparation "Universal" in the optimal dose had a positive effect on the growth of live weight, significantly increased the blood content of some morphological parameters, feed additive tested in the feed for different species of poultry. At the same time, the economic efficiency per head per 1 ruble of additional costs ranged from 4 to 8 ru

Keywords: poly-enzyme preparation, rats, poultry, growth dynamics, hematological parameters.

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INTRODUCTION

Poultry farming as a precocious industry is of great importance in the agro-industrial complex of Russia, significantly expanding the sources of human nutrition. In industrial poultry at this stage, highly productive poultry crosses are used, genetically determined productivity potential of which can be realized, first of all, with balanced feeding and compliance with the hygienic requirements of poultry keeping.

In industrial conditions, with the flow of all technological processes, intensive cultivation of birds (chickens, turkeys and ducks-broilers) is accompanied by adverse effects of various environmental factors, which affects the reduction of resistance, preservation of livestock and productivity [1, 2, 5, 7]. Therefore, modern technologies in poultry farming are aimed at preventing the loss of poultry, which brings significant losses to producers. It is believed that this problem can be solved by creating such conditions of feeding and keeping for poultry, which will enhance the physiological and biochemical status of their body. One of the possible ways to improve the physiological status of the poultry organism is the skillful selection of feed, which ultimately will allow to achieve maximum realization of genetically determined productivity [3, 8, 10, 11].

Intensification of the poultry industry involves the use of complete feed, balanced in all elements of nutrition, with the maximum use of grain feed of local production.

The specifics of the feed base of the main regions of Russia are typical barley-type diets with the addition of sunflower meal or cake, wheat bran, characterized by low availability of nutrients and energy. And to increase the energy and nutritional value of diets, poultry farmers should be introduced into their composition enzyme preparations that break down the shell of plant cells, which increases access to nutrients. In feeding birds should take into account the fact that the composition of the feed includes cereals with various non-starchy polysaccharides, which in turn require a more careful selection of endogenous enzymes or multi-enzyme complexes [4, 6, 7, 9, 11].

In this regard, the purpose of our research was to study the effect of domestic poly-enzyme preparation "Universal" on some quantitative indicators of chickens, turkeys and ducklings in the production of poultry meat.

MATERIALS AND METHODS

Toxicological evaluation of the multi-enzyme preparation " Universal "was carried out in the Federal center for Toxicological and radiation safety of animals (Kazan) in the framework of joint cooperation with the head of the Department of toxicology, doctor of biological Sciences, professor M. Tremasov.

The experimental part of the research consisted of a complex of laboratory, physiological, scientific and economic experiments.

To determine the effect of feeding hydrolyzed feed on the physiological state and growth rate of laboratory animals in vivarium conditions of Kazan state Academy of veterinary medicine was conducted laboratory experiments on mongrel rats. The duration of the experiment was 45 days.

Animals of the first control group received the basic diet consisting of feed and cereal grain mixture. In the diet of animals of the second experimental group was added hydrolyzate of cereal grain mixture obtained using the poly-enzyme preparation " Universal "(research center" Feed", Kazan).

During the experiments, clinical observations were constantly carried out, taking into account the General condition, food excitability, stool consistency, indicative reflexes and weight of rats.

Scientific and economic experiments on poultry were carried out according to the generally accepted methodology in the advanced poultry complexes of the Republic of Tatarstan in the period 2017-2018. The experiments were carried out according to the technological standards of keeping and feeding birds. In the experiments, the effect of the poly-enzyme preparation "Universal" on the metabolism and productivity of chickens, turkeys and ducklings-broilers was studied. For the experiment, 80 birds were selected in each type of broiler, of which 2 groups of 40 heads were formed. The first group was a control group and received feed

according to the feeding program adopted in the poultry complex. The composition of the feed broilers experimental groups were added to the enzyme preparation "Universal" at a dose of 0.1% of its weight. The duration of scientific and economic experience was 38 days in chickens, 45 days in ducklings and 112 days in broiler turkeys.

The composition of the multi-enzyme preparation "Universal" includes amylosubtilin with an active substance content of 1300 u/g, protosubtilin with an active substance content of 67.3 u/g and celloviridin with an active substance content of 2000 u/g.

During the experiments, clinical observations were carried out, which took into account the General condition, the consistency of the litter and the mass of turkeys. Every day we kept records of the safety of livestock, consumption and palatability of feed. On the results of feeding concluded to change the dynamics of live weight and average daily gains, as well as feed costs.

Weekly changes in live weight of birds were determined by individual weighing during the entire period of experience, the safety of livestock. Zootechnical analysis of feed was carried out according to the generally accepted methods in the laboratories of farms.

At the end of the experimental period studied morphological and biochemical parameters of blood of birds. Blood was taken from the axillary vein into a tube containing heparin anticoagulant. The blood levels of erythrocytes, leukocytes, hemoglobin, total protein, hematocrit, calcium, phosphorus were determined by conventional methods.

Economic indicators of application of the studied additives in diets of birds are calculated by the method of determination of economic efficiency of use in agriculture of results of research works, new equipment, inventions and rationalization offers. The significance of differences is determined by the student's criterion.

RESULTS AND DISCUSSION

The results of laboratory studies have shown that the multi-enzyme preparation "Universal" according to GOST 12.1.007.76 on the degree of danger belongs to the fourth class of chemicals, according to the classification – to low-toxic compounds.

Feeding hydrolysates had no negative impact on the safety and physiological state of rats, consistency and color of feces. We found that during the experiment the animals ate food well, the remains were not observed. At the same time, feeding the hydrolysate had a positive effect on the growth and development of laboratory animals.

At the beginning of the experiment, the live weight of rats in the control group was 40.7 g, and animals in the experimental group 42.0 g. after 15 days, the weight of animals in the control group was 52.3 g, in the experimental group 57.0 g, at the end of the experiment, the live weight of rats in the groups was 102.3 g and 123.3 g, respectively. consequently, feeding the rats with the grain mixture hydrolyzed by the Universal drug contributed to an increase in body weight compared to the control by 21.0 g or 20.5%. A similar pattern was observed in the average daily live weight gain and the total gain over the period of experience.

Studies have found that by the end of the experiment on the morphological parameters of the blood of rats of the control and experimental groups no significant differences were found. There was a tendency to some increase in the number of red blood cells in the blood of animals receiving the enzyme preparation "Universal". Analyzing the biochemical parameters of blood, it should be noted that in rats of the experimental group the hemoglobin content was 188 g/l, which is 27.1% significantly higher than the control.

Live weight is an indicator of growth and development of poultry, reflecting the impact of feeding and housing conditions in which broiler chickens are grown. Live weight determines within the species, breed morphological features of the Constitution, the nature and degree of tension of physiological processes in the body.

The results of scientific-economic experiments suggests that the application of the multienzyme preparation "Universal" indicators of fattening broilers has improved significantly.

Thus, the average live weight of day-old broiler chickens was 41.5-41.7 g, at the age of 7 days - in chickens receiving the main diet, the live weight was 143.7 g, while in broilers of the experimental group receiving feed with an enzyme preparation, it reached 162.2, which was 12.9% higher than in the control group. The average daily increase was 17.0 g in the control group and 20.08 g in the experimental group (table 1).

Table 1: productivity of broiler chickens during the 38-day growing period

Indicators	Group	
	control	experimental
Number of goals	40	40
Live weight (g) aged: (days)		
1	41,5±1,3	41,7±1,1
7	143,7±12,6	162,2±10,1
14	344,1±24,4	400,1±20,9
21	745,7±28,6	815,4±22,0
28	1158,5±33,1	1236,4±43,6
37	1701,7±50,8	1871,4±51,1*
Absolute live weight gain, g	1660,2±65,6	1829,7±63,2
Average daily gains (g) for the periods:		
1 to 7 days		
7 to 14 days	17,0±1,5	20,1±1,9
14 to 21 days	28,6±1,9	33,0±1,7
21 to 28 days	57,4±1,1	59,3±0,8
21 to 37 days	59,0±0,8	60,1±0,6
for the entire period of experience	60,4±3,1	70,6±3,9
	43,7±1,5	48,2±1,8
In % to control	100,0	110,2

Analysis of the results of weighing broilers at the age of 14 days showed a high intensity of broiler growth in the experimental group, which used the enzyme preparation "Universal". Thus, the average live weight of chickens in this period was 344.1 g in the control group and 400.1 g in the experimental group, which is higher by 16.3 %. The average daily increase in the control group for the period from 7 to 14 days was 28.6 g, in the experimental group-33.0 g.

A similar trend was observed with the further growth and development of broiler chickens. Over the entire period of growing broilers of the experimental group developed better control to 38-day age, their live weight was 1871.4 g, significantly exceeding the results of the control group by 10.0 %. The average daily increase in the live weight of broilers of the experimental group receiving the domestic multi-enzyme preparation "Universal" was 48.2 g, which is higher than the control by 10.2 %. The use of poly-enzyme preparation "Universal" allowed to reduce the cost of feed per unit of production compared to the control group by 8.0 %. This is due to better digestibility and the use of broiler feed nutrients.

General blood testing is one of the most important methods that subtly reflects the body's response to various factors. The composition of blood is an indicator of the physiological state of the body of chickens and is closely related to the productivity of poultry.

Analysis of blood studies of broiler chickens showed a positive effect of the introduction of the diet of the enzyme preparation "Universal". Hematological studies have shown a stimulating effect of the drug on hematopoiesis, which resulted in an increase in red blood cells, hemoglobin, hematocrit and protein within the physiological norm, while the number of leukocytes tended to decrease, indicating an increase in the immune status in broilers of the experimental group. The content of calcium and phosphorus in the blood serum of chickens of all groups was also within normal limits.

On the basis of the data of scientific and economic experience on turkeys it was found that the introduction of the poly-enzyme preparation "Universal" to the birds of the experimental group had a positive effect on the increase in live weight gain (table 2).

Analysis of the data presented in table 2 showed that the increase in the live weight of turkeys during the first four weeks of cultivation took place without significant differences. This can be interpreted as a manifestation of the General reactivity of the body of turkeys of experimental groups on the components of the drug used.

At the age of 21 days, the average live weight of turkeys receiving compound feed according to the feeding program was 876 g, while the turkeys of the experimental group receiving the multi-enzyme preparation "Universal", it reached 872 g.the average Daily growth was 37.6 g in the control group and 37.3 g in the experimental group.

Table 2: productivity of Turkey broilers for 112-day growing period

Indicators	Group	
	control	experimental
Number of goals	40	40
Live weight (g) aged: (days)		
1	87±2,2	88±1,7
21	876±4,2	872±3,5
28	1416±4,5	1372±3,8***
35	2032±16,3	2004±14,6
42	2820±32,4	2876±30,2
49	3144±45,3	3530±42,1**
56	3772±63,6	4064±39,7***
63	4770±71,2	5593±65,4***
70	5350±74,3	6183±70,7***
77	5810±84,5	6700±72,8
84	6280±93,8	7470±73,1***
91	6682±94,5	8030±77,0***
98	7284±94,9	8570±80,3***
105	7990±86,7	9033±85,0***
112	8735±98,2	9817±89,7***
In % to control	100,0	112,3
Absolute live weight gain, g	8648	9729
Average daily gains (g) for the periods:		
1 to 21 days		
21 to 42 days	37,6	37,3
42 to 63 days	92,5	95,4
63 to 84 days	92,8	129,4
84 to 112 days	71,9	89,3
for the entire period of experience	87,6	83,8
	77,2	86,8
In % to control	100,0	112,4

In the subsequent period, the turkeys of the experimental group showed a higher growth rate, so by the end of cultivation the live weight exceeded the same index of turkeys of the control group by 12.3 %.

The morphological composition of the blood is influenced by many factors, including the immune status of birds, and are of great diagnostic value.

Thus, in the control group on day 112 studies observed lower hemoglobin. In turkeys of the experimental group on the background of the use of the enzyme preparation "Universal" hemoglobin content was higher by 3.7 %, erythrocytes by 5.6 %, due to increased erythropoiesis. The number of white blood cells on the contrary decreased by 2.7 %, due to increased immunity in turkeys of the experimental group.

The increased content of hemoglobin and erythrocytes in turkeys of the experimental group can be considered as a factor of more intensive redox processes in the body of birds, which is confirmed by the relationship of morphological parameters of blood with the growth of live weight.

The study of protein metabolism in the body of birds showed that the total protein content in the serum of turkeys was within the physiological norm. At the same time, the amount of total protein in the experimental group of birds was 9.2% more than the control indicators.

Scientific and economic experience in ducklings with inclusion in their diets of the multi-enzyme preparation "Universal" confirmed the results of previous studies as the growth dynamics of other species of birds and hematological parameters (table 3).

Table 3: productivity of ducks for 45-day period of cultivation

Indicators	Group	
	control	experimental
Number of goals	40	40
Live weight (g) aged: (days)		
15	584,4±12,5	584,8±14,7
25	1135,6±24,2	1290,0±38,5
35	2330,0±42,5	2650,0±46,8
45	2840,8±56,3	3360,6±60,6
In % to control	100,0	118,3
Absolute live weight gain, g	2256	2776
Average daily gains (g) for the periods:		
15 to 25 days		
25 to 35 days	55,1	70,6
35 to 45 days	119,5	136
for the entire period of experience	51,1	71,1
	75,2	92,5
In % to control	100,0	123,0

Experimental groups of ducklings were formed at the age of 15 days by the method of analogues. The average live weight of birds in the control and experimental groups was 584.4 g and 584.8 g. by 25 and 35 days of age, the average live weight of ducklings was 1135.6 g and 2330.0 g, in birds of the experimental group receiving the enzyme preparation "Universal" in the optimal dose – 1290.0 g and 2650.0 g, respectively. At 45 days of age, the live weight of the control group ducks was 2840.8 g, the experimental group-3360.6 g, which is 18.3% more.

The average daily growth of the control group ducklings for the period of experience was 75.2 g, the experimental group-92.5 g, which is 23.0 % more.

At the end of the experimental period were studied morphological parameters of blood. The use of the enzyme preparation caused an increase in the number of red blood cells by 4.2 % in comparison with the analogues of the control group. The content of hemoglobin in ducks of the experimental group increased by 5.1%. The number of white blood cells did not change significantly and had no significant differences.

Economic efficiency determines the result of any animal husbandry activity. Profitability of the enterprise in the production of Turkey meat is characterized by a system of indicators: feed consumption per unit of production; labor costs for production; unit cost of production and profit from the sale of all products.

After carrying out experimental studies on the data obtained, the economic efficiency of the use of the poly-enzyme preparation "Universal" in mixed fodders for poultry was calculated. At the same time, the economic efficiency per head per 1 ruble of additional costs ranged from 4 to 8 rubles.

CONCLUSION

Thus, the inclusion in the composition of feed chickens, turkeys and ducklings of the multi-enzyme preparation "Universal" of domestic production at a dose of 0.1% of its weight had a positive impact on the quantitative indicators of birds and on metabolism in General, which affected the increase in their live weight, which is a lifetime assessment of meat productivity, and improvement of hematological indicators. The use of the drug is advisable, which is confirmed by calculations of economic efficiency.

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