

# The influence of drugs with a synergistic mixture of phencides on the intensity of invasion, morphological blood parameters and leukocyte formula in chicken eimeriosis mixed with colibacillosis

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**Abstract.** In this work, we studied the synergistic preparations phencid and phencid premix prepared by us in doses of 288 mg/kg and 1000 mg/kg to the feed, which reduce the intensity of invasion by almost 4-5 times and their use at the above doses does not negatively affect the morphological parameters and the leukocyte formula of the blood of birds. Considering the relevance, these drugs can be used for the prevention and treatment of these diseases. For this purpose, birds were experimentally infected simultaneously with pathogens of *Eimeria* and *Escherichiosis*. As a result, it was found that the tested drugs reduce the intensity of invasion by 4-5 times and do not have a negative effect on the morphological composition of the blood and the leukocyte formula.

## 1 Introduction

In the Republic of Uzbekistan, chicken breeding is one of the leading branches of livestock breeding, and they are mainly raised in joint-stock companies, limited liability companies, peasant farmers and private auxiliary farms. especially with colibacteriosis, most of the chickens die, and the rest lag behind in growth and development, causing great economic damage to farms. multiplying in the mucous membranes in a schizogonous way, it destroys the integrity of the epithelial cells and opens the way for intestinal microorganisms to enter the blood. At this time, inflammatory processes increase and prevent the absorption of substances necessary for the body. For the prevention and treatment of these diseases, coccidiostats and antibiotics are used separately [1-3, 5]. However, pathogens quickly get used to the drugs used. Taking into account the above problems, an antibiotic, vitamin phencid synergistic mixture and its phencid premix types were created on the basis of ferulene isolated from the plant *Ferula assofoetida*, which grows in the mountainous and

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desert regions of the Republic of Uzbekistan. Its effectiveness against colibacteriosis was tested in laboratory experiments. We set ourselves the goal of studying the effect of the drugs used in this experiment on the intensity of invasion and on the morphological parameters of blood and leukocyte formula during a period of coexistence with Eimerioz colibacteriosis.

## 2 Materials and methods

For laboratory experiments, one-day-old chicks belonging to the "Ross 308" cross were brought from the chicken farm and placed in a small chicken house in a common gala on the beds, and at the age of fourteen days, five groups of 20 heads were formed. In particular: the first is a relatively clean control group, they were fed with clean food without drugs until the end of the experiment, the second is a control group infected with pathogens and not treated, which were previously titrated sporulated oocysts with a killing dose of O'D50-70 ( 0.5 ml of *E. servulina* 125 000, *E. maxima* 8000, *E. tenella* 25 000) in 1 mm<sup>3</sup> suspension was injected into the scrotum of each chick through a syringe probe, and *E. coli* culture was injected into the abdomen by 0.3 ml. was sent to space. The number of oocysts in the litter on the 5th, 7th, 10th, 15th and 20th days of the experiment according to the GOST 25383-82 (ST SEB 2547-80) "Metody laboratornoy diagnostiki coccidiosis" manual. is multiplied. Chicks in the third experimental group were given 288 mg/kg of the drug with synergistic mixture of Phencid for 10-12 days immediately after infection. The composition of the Fensid synergistic mixture drug is as follows: Ferulen 30mg/kg, Levomycetin 188mg/kg and Phtalozol 70mg/kg were given with a total of 288mg/kg of food. The chickens of the fourth experimental group were infected with eimeria and colibacteriosis cultures and were given 1000 mg/kg of the drug in the form of a premix of fencid for 10-12 days. Its composition is ferulene 30mg/kg, levomycetin 188mg/kg and phthalozol 70mg/kg, vitamin U(S-methylmethionine) 0.003mg/kg, vitamin K 0.4mg/kg, the rest is made up of santhoxin and wheat bran and chicks of group 5 were given Spektril-S with 1 ml/2 l of water for 5 days, Spektrazuril-T with 1 ml/1 l of water for 2 days with water throughout the day according to the instructions. During the experiment, blood was taken from the underwing vein and the amount of hemoglobin in it was determined by the hemoglobin-cyanide method (with acetonecyanhydrin) on the KFK-2 device according to the instructions of [11] of et.all. The number of erythrocytes, leukocytes and thrombocytes in 1 mm<sup>3</sup> of blood was determined by counting with the method of [4] on the Goryayev counting grid, stained with Romanov Giemza and methylviolet dyes. To determine the leukocyte formula in the blood smear, it was stained by the Poppenheim method and counted by the Filipchenko three-field method. The obtained numbers were subjected to statistical processing according to the method of [10], and the degree of accuracy was determined from the Student table.  $P < 0.05$ .

The reproduction of oocysts is of great importance in the specific activity of the synergistic mixture drugs used in the treatment of eimeriosis and colibacteriosis of chickens and in the formation of immunity formed in the body against eimeriosis.

## 3 Results

Considering the above problems, it is of practical and scientific interest to determine the spheres of influence of synergistic preparations of mixtures on the reproductive properties of oocysts. To implement the task, on days 5-7-10-15 and 20 of the experiment, droppings samples were taken from each group and the number of oocysts in 1 gram of droppings was determined. The results of laboratory experiments are presented in Table 1.

**Table 1.** The influence of phencid and phencid premix on the intensity of invasion.

S/n	Group name	The drug name	Dose (mg/kg food)	Number of chicks	Save flexible rate (%)	Infestation intensity (1000 oocysts in 1 g of feces)				
						Inspection days				
						5	7	10	15	20
1	A relatively clean control	-	-	20	100.0	-	-	-	-	-
2	Comparative infected control	-	-	20	15.0	1.314	1.820	272	53	8
3	Experience	Phencid	288	20	100.0	263	524	61	8	1
4	Experience	Phencid premix	1000	20	100.0	250	498	55	7	1
5	Experience	Spectril-S Spectra-zuril-T	5 days with 1ml/2l water 2 days with 1 ml/l of water	20	100.0	301	544	69	57	2

During the experimental period, group 2 and group 5 chicks shed permanent oocysts with their droppings. In particular, on the fifth day of the experiment, chicks in the untreated control group were exposed to 1,314 oocysts per 1 g of feces. The number of oocysts in 1 gram of droppings was 263,000 when the chickens in the third experimental group received the fencid synergistic mixture drug at 288 mg/kg of feed for 10 days, and 250,000 when the chicks in the fourth experimental group received the phencid premix drug at 1000 mg/kg of feed for 10 days. and when chickens in the fifth experimental group were given Spektril-S 1 ml/2l for 5 days, Spektra zuril-T 1 ml/l water for 2 days, the number of oocysts in 1 g of litter was 301 thousand.

On the seventh day of the experiment, the chicks of the second group with 1 gram of litter averaged 1 million 820,000, the chicks of the third experimental group with 1 gram of litter 524 thousand, the chicks of the fourth experimental group with 1 gram of litter, and the chicks of the fifth experimental group with 1 gram of litter 544 isolated a thousand oocysts.

By the tenth day of the experiment, chicks of the second group released an average of 272,000 oocysts with 1 gram of feces, chicks of the third experimental group released 61,000 oocysts with 1 gram of feces, chicks of the fourth and fifth experimental groups released 55-69 thousand pieces of oocysts with 1 gram of feces. 15-20 days of the experiment by the end of the day, 53-8 thousand chicks of the second group, 8-1, 7-1 thousand and 57-2 thousand chicks of the 3rd, 4th and 5th experimental groups were separated from oocysts with 1 g of feces. As a result of the obtained laboratory experiments, chickens in the second comparative infected and untreated control group shed 1314-1820 thousand oocysts in 1 gram of feces on the 5th-7th day of the experiment. Chicks in the remaining experimental group also secreted maximum oocysts with 1 g of droppings. The phencid and phencid premix preparations used in the experiment released several times less oocysts compared to the number of oocysts in the droppings of chicks of the second group. This protects it from the damage of the external environment, even if only partially.

Indicators indicating the general functional state of the body include indicators of general hematological and serum proteins in the blood of chickens.

On days 5-7-10-15-20 of the experiment, blood was taken from the chickens from the subwing vein, the amount of hemoglobin, the number of erythrocytes, leukocytes and platelets in 1 mm<sup>3</sup> of blood was determined, as well as the results obtained. when a blood smear was prepared and the leukocyte formula was determined on these days are given in tables 2-10.

**Table 2.** The influence of phencid and phencid-premix on the number of erythrocytes ( $10^{12}/l$ ) with a mixed course of eimeria and colibacillosis in chickens M±m.

No.	Groups	Inspection days				
		5	7	10	15	20
1	Pure control group	2.61±0.14	2.55±0.14	2.67±0.09	2.70±0.08	2.68±0.07
2	Infected experimental group	1.88±0.16 <sup>x</sup>	1.32±0.06 <sup>xxx</sup>	2.50±0.17	2.71±0.09	2.71±0.06
3	The experimental group phencid	2.54±0.09	2.56±0.07	2.63±0.09	2.69±0.20	2.63±0.28
4	The experimental group phencid premix	2.59±0.11	2.58±0.09	2.64±0.12	2.72±0.15	2.67±0.05
5	Experimental group Spectril-S Spectrazuril-T	2.60±0.15	2.57±0.05	2.58±0.15	2.71±0.19	2.69±0.14

Note: x-p<0.05; xxx-p<0.01

**Table 3.** Effect of phencid and phencid premix on the amount of hemoglobin in the blood (g/l) with a mixed course of eimeria and colibacillosis in chickens M±m.

No.	Groups	Inspection days				
		5	7	10	15	20
1	Pure control group	89.6±0.6	90.0±0.8	93.5±0.7	96.3±0.7	95.4±0.9
2	Infected experimental group	72.2±2.5 <sup>xxx</sup>	61.0±1.8 <sup>xxxx</sup>	82.4±1.2	92.5±1.7	96.0±1.1
3	The experimental group phencid	89.0±0.2	87.5±0.9	88.9±0.9	95.5±0.3	95.8±0.7
4	The experimental group phencid premix	87.4±0.9	89.8±0.92	90.0±0.8	97.0±0.5	96.8±0.6
5	Experimental group Spectril – S Spectrazuril - T	88.5±0.8	89.0±1.0	89.4±0.7	95.7±1.5	94.3±1.5

Note: xxx-p<0.011; xxxx-p<0.001

**Table 4.** Effect of phencid and phencid premix on the number of leukocytes in the blood ( $10^9/l$ ) with a mixed course of eimeria and colibacillosis in chickens M±m.

No.	Groups	Inspection days				
		5	7	10	15	20
1	Pure control group	26.4±0.41	27.0±0.51	27.0±0.73	26.7±0.50	27.1±0.49
2	Infected experimental group	27.1±1.48	29.4±1.64 <sup>x</sup>	38.4±2.0 <sup>xxx</sup>	32.2±1.52 <sup>x</sup>	27.4±1.27
3	The experimental group phencid	27.0±0.67	26.6±0.37	26.8±0.66	26.8±0.37	27.0±0.71
4	The experimental group phencid premix	26.6±0.51	26.5±0.44	26.7±0.92	26.9±0.61	27.5±0.51
5	Experimental group Spectril-S Spectrazuril-T	26.2±0.45	26.7±0.55	26.9±1.00	27.0±0.72	27.8±0.49

Note: x-p<0,05; xxx-p<0,01

**Table 5.** The influence of phencid and phencid premix on the number of platelets ( $10^9/l$ ) with a mixed course of eimeria and colibacillosis in chickens M±m.

No.	Groups	Inspection days				
		5	7	10	15	20
1	Pure control group	36.9±0.11	36.0±0.35	36.5±0.43	35.7±0.35	34.3±1.02
2	Infected experimental group	27.3±1.36 <sup>x</sup>	38.9±0.71	49.1±0.52 <sup>x</sup>	41.1±1.01	36.3±1.20
3	The experimental group phencid	36.7±0.51	35.0±2.03	36.9±0.63	36.1±1.09	36.0±1.02
4	The experimental group phencid premix	36.4±0.58	35.3±0.89	36.4±0.94	36.0±0.66	35.9±1.07
5	Experimental group Spectril-S Spectrazuril-T	36.3±0.15	35.7±0.12	35.8±0.45	35.6±0.45	34.7±0.98

Note: x-p<0.05

**Table 6.** The influence of phencid and phencid premix on the number of basophils in the blood (%) with a mixed course of eimeria and colibacillosis in chickens M±m.

No.	Groups	Inspection days				
		5	7	10	15	20
1	Pure control group	2.2±0.24	2.4±0.21	2.2±0.23	2.2±0.20	2.2±0.20
2	Infected experimental group	2.0±0.31	2.2±0.37	2.2±0.37	2.2±0.20	2.2±0.20
3	The experimental group phencid	2.0±0.31	2.2±0.37	2.2±0.37	2.2±0.20	2.2±0.20
4	The experimental group phencid premix	2.0±0.31	2.2±0.37	2.2±0.20	2.2±0.20	2.2±0.20
5	Experimental group Spectril-S Spectrazuril-T	2.2±0.24	2.2±0.21	2.2±0.23	2.2±0.21	2.2±0.23

Note: <sup>x</sup>-p<0.05

**Table 7.** Effect of phencid and phencid premix on the number of eosinophils in the blood (%) in mixed cases of eimeria and colibacillosis in chickens M±m.

No.	Groups	Inspection days				
		5	7	10	15	20
1	Pure control group	3.2±0.21	3.0±0.31	3.4±0.24	3.4±0.24	3.4±0.24
2	Infected experimental group	4.2±0.73 <sup>x</sup>	4.6±0.68 <sup>xx</sup>	3.2±0.20	3.2±0.21	3.4±0.24
3	The experimental group phencid	3.0±0.31	3.2±0.20	3.4±0.24	3.2±0.20	3.2±0.20
4	The experimental group phencid premix	3.0±0.31	3.2±0.37	3.2±0.20	3.2±0.20	3.4±0.24
5	Experimental group Spectril-S Spectrazuril-T	3.2±0.21	3.2±0.20	3.2±0.24	3.2±0.21	3.4±0.20

Note: <sup>x</sup>-p<0.05; <sup>xx</sup>-p<p<0.02

**Table 8.** The influence of phencid and phencid premix on the number of pseudo eosinophils in the blood (%) in a mixed course of chicken eimeria and colibacillosis M±m.

No.	Groups	Inspection days				
		5	7	10	15	20
1	Pure control group	28.8±0.88	28.2±0.57	27.8±0.49	26.8±1.76	27.6±1.80
2	Infected experimental group	44.4±1.03 <sup>x</sup>	46.8±2.49 <sup>xx</sup>	39.2±1.24 <sup>x</sup>	30.8±1.52	27.8±1.88
3	The experimental group phencid	28.6±0.33	28.4±0.45	28.0±1.73	27.6±1.40	27.4±0.92
4	The experimental group phencid premix	27.4±1.43	28.2±1.65	26.8±1.56	26.6±0.71	27.2±1.02
5	Experimental group Spectril-S Spectrazuril-T	27.6±0.35	28.5±0.52	27.2±0.71	27.1±0.35	27.8±1.22

Note: <sup>x</sup>-p<0.05

**Table 9.** The influence of phencid and phencid premix on the number of lymphocytes in the blood (%) with a mixed course of eimeria and colibacillosis in chickens M±m.

No.	Groups	Inspection days				
		5	7	10	15	20
1	Pure control group	58.0±0.94	56.8±2.99	57.0±2.06	56.6±1.20	56.2±1.15
2	Infected experimental group	49.2±2.15 <sup>x</sup>	39.2±1.62 <sup>xx</sup>	42.0±2.60 <sup>x</sup>	48.8±1.98	56.8±1.06
3	The experimental group phencid	58.4±0.67	57.0±2.58	57.6±2.29	57.4±1.43	57.4±1.20
4	The experimental group phencid premix	57.2±1.11	57.2±2.17	58.4±1.99	56.2±2.03	57.6±0.81
5	Experimental group Spectril-S Spectrazuril-T	57.6±0.87	57.3±2.71	57.6±2.55	56.9±1.49	57.5±0.92

Note: <sup>x</sup>-p<0.05; <sup>xx</sup>-p< 0.02

**Table 10.** The influence of phencid and phencid premix on the number of monocytes in the blood (%) with a mixed course of eimeria and colibacillosis in chickens M±m.

No.	Groups	Inspection days				
		5	7	10	15	20
1	Pure control group	4.6±0.51	4.4±0.51	4.4±1.20	4.6±0.81	4.6±0.60
2	Infected experimental group	6.6±0.92 <sup>x</sup>	6.6±1.21 <sup>x</sup>	7.2±0.58 <sup>x</sup>	5.4±0.51	4.8±0.37
3	The experimental group phencid	4.6±0.51	4.6±0.51	4.4±0.67	4.6±0.81	4.4±0.40
4	The experimental group phencid premix	4.6±0.51	4.4±0.81	4.4±0.51	4.0±0.70	4.6±0.51
5	Experimental group Spectril-S Spectrazuril-T	4.6±0.55	4.4±0.27	4.4±0.37	4.4±0.45	4.6±0.49

Note: <sup>x</sup>-p<0.05

The main changes in blood composition were observed in the blood parameters and leukocyte formula of chickens of the control group that were not exposed to secondary infection. However, the blood parameters of chickens from the experimental groups did not differ from the blood parameters and leukocyte formula of chickens from the pure control group.

Thus, on the 5th day of the experiment, the number of erythrocytes in the blood of chickens of the second group decreased by 18%, the hemoglobin content by 19.5%, and the number of platelets by 22.1% compared to the blood values of chickens of the second group. pure control group, and the number of leukocytes from the blood parameters of chickens of the first group did not matter

The quantity of eosinophils in the leukocyte formula increased by 31.2%, pseudoeosinophils by 54.2%, monocytes by 43.4%, and the number of lymphocytes decreased by 15.2% P<0.05. By the end of the experiment, the number of basophils did not differ from the blood parameters of chickens of the first group P < 0.05.

By the 7th day of the experiment, the number of erythrocytes in the blood of chickens of the second group decreased by 48.3%, the amount of hemoglobin decreased by 42.3%, but the number of leukocytes increased by 9.0% and the number of platelets increased. by 8.0%

Eosinophils in the leukocyte formula increased by 53.3% P<0.02, pseudoeosinophils by 66.0% P<0.02, the number of monocytes by 50.0% P<0.05%, and the number of lymphocytes increased by 31.0 % P<0.02<0.02 decreased.

By the 10th day of the experiment, the number of erythrocytes and the amount of hemoglobin in the blood of chickens of the 2nd group did not differ from the blood parameters of chickens of the 1st group. But the number of leukocytes decreased by 42.2% P<0.01 and platelets by 33.5% P<0.05. The number of eosinophils in the leukocyte formula did not differ almost significantly from the blood parameters of chickens of the first group. But pseudoeosinophils increased by 41.0% P<0.05, monocytes by 64.0% P<0.05%, and the number of lymphocytes decreased by 26.4% P<0.05.

By the 15th day of the experiment, the number of leukocytes in the blood increased by 20.5% P<0.05, and the number of platelets increased by 15.1% compared to the blood values of the first group of chickens.

Among the types of leukocytes in the leukocyte formula, pseudoeosinophils increased by 15.0%, monocytes by 17.4% compared to the blood indicators of the first group of chickens, and the number of lymphocytes decreased by 16.0%.

By the 20th day of the experiment, the morphological blood parameters and the number of types of leukocytes in the leukocyte formula did not differ from the blood parameters of chickens of the first comparative pure control group. P<0.05.

Judging by the data obtained as a result of laboratory experiments, with the combined disease of colibacillosis in chickens, changes in the morphological parameters of the blood and leukocyte formula were observed in the blood of chickens from the comparative control group, infected with pathogens and not subjected to treatment. But given that coccidiostats,

phencid drugs and phencid premixes used in the treatment of diseases do not have a negative effect on morphological blood parameters and leukocyte formula, these drugs can be used for the treatment and prevention of diseases in future industrial practice.

## 4 Discussion

Eimeria pathogens multiply intensively in the mucous membranes of the intestinal system of chickens, exit with feces and damage the external environment. Drugs used against these pathogens reduce the intensity of invasion several times.

In our laboratory experiments, it was observed that the intensity of the main invasion was high in the control group infected with pathogens, that is, in the control group not exposed to treatment, therefore, on days 5-7 of the experiment, 1 million 320 000-1 million 820 000 oocysts were isolated from 1 g of litter. When chickens of the experimental groups were infected with pathogens of Eimeria and colibacillosis and received 288 mg/kg of the phencidal synergistic mixture and 1000 mg/kg of the phencidal premix with food for 10-12 days, the intensity of the invasion decreased by 4-5 times. The results obtained [6] are consistent with the information given in [7,8,9,13].

When studying the morphological parameters of blood and the effect of the premix Phencid on the leukocyte formula, which was used in the experiment to create an associative course of diseases of eimeria and colibacillosis in chickens, until the end of the 20-day experiment, the morphological parameters of the blood and the numbers obtained from the leukocyte formula were significantly different from the indicators blood of chickens from the pure control group. But in chickens of the control group that did not receive treatment, morphological blood parameters and changes in the leukocyte formula were observed. Results obtained during the experiment [12] et.others corresponds to the information

## 5 Conclusion

Synergistic mixtures of phencid preparations and its premixed form reduce the intensity of invasion by almost 4-5 times.

Phencid and phencid premix in the treatment of eimeriosis and colibacillosis do not adversely affect the morphological parameters of the blood of chickens, as well as the leukocyte blood count.

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