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The Influence of the Probiotic "Rescue Kit" On the Growth and Development of Accelerated Rabit Youngsters under the Conditions of Northern Kazakhstan.

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ABSTRACT

The article presents the results of application of probiotic preparation "Rescue Kit" (Germany) for rearing of early developed rabbits of "White Giant", «Soviet Chinchilla» breeds and their hybrids. Probiotic "Rescue Kit" is a homogeneous fine powder white to cream color with a slight milky odor. Feed additive contains a freeze-dehydrated culture of Bacillus subtilis and Bacillus licheniformis. The use of probiotic preparation "Rescue Kit" in the diets of young animals normalizes gastrointestinal tract, improves accessibility of feeding stuff, increases average daily gains, and ensures better preservation of young animals up to their slaughter. It is revealed that the application of probiotic "Rescue Kit" in various doses provided the improving effect on the accessibility of dietary nutrients in young early developed rabbits of different groups.

Keywords: probiotics, early developed rabbits, Eimeria, gastrointestinal tract, rabbit meat, meat productivity.

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INTRODUCTION

Rabbit breeding in Kazakhstan is one of the infant sectors of agribusiness. Due to providing high quality dietary food stuff, it plays today an important role, since in animal husbandry it is the most dynamic sector, able to overcome all the severities in a shorter time and develop sustainably [1].

To develop rabbit breeding in the country, in the first place, it is necessary to pay attention to the improvement of technological methods of animal management and feeding. A major problem in rabbit breeding is the quality of feeding stuffs, since it is often contaminated by toxigenic enterobacteria. In addition to toxicosis in animals, enterotoxins activate intracellular parasites that cause eimeriosis disease in young early developed rabbits [2].

Eimeriosis is one of the most common disease of rabbits that still continues to be an urgent issue in the industry. This protozoal disease, occurring in form of enzootic outbreaks, causes significant economic damage due to the high mortality of animals, which can reach 85% or even more. Animals suffering from eimeriosis are stunted and lose from 12 to 30% of their weight. Rabbits of all breeds are susceptible to pathogen invasion, though this disease hurts mostly the young rabbits at the age of 20...70 days and older animals. Sick as well as recovered animals may become source of invasions. In turn, they become infected via infected feed, water, cage, and feeder. Besides, Eimeria oocysts can be conveyed by wild birds, rodents, insects, as well as the servitorial staff on their clothing and footwear. The disease hurts mainly young animals, whereas adults are infestations carriers. Infestation occurs only through the digestive tract [3, 4].

In recent years, for disease prevention, treatment of animals and increase of their productivity, probiotics of next generation - bacterial preparations of live microbial cultures - are widely used. Their antitoxic activity substantially reduces the pathogenic role of intracellular parasites (viruses, protozoa, etc.) [5]. Studies, conducted by domestic and foreign scholars, testify large potential applications of probiotics in the feeding of rabbits that improve the efficiency of feeding stuffs, save the fodder resources and increase the productivity of rabbits. According to Loenko N.N. (2008), the use of probiotic preparations in animal breeding have a beneficial impact on the safety of youngsters. Also, according to Tinaev, N.N. and Emelyanenko, P.A. (2006), probiotics have a positive effect on the reproductive ability of doe, their fecundity, and the increase in kit crop per female mink. Positive results were obtained in all cases, though the available information on their application concerns various probiotic preparations used in different doses [6].

Thus, the acquisition of new integrated data on the effects of the probiotic "Rescue Kit" on animal body and improvement of the productive qualities of early developed rabbits is a topical research area, which would produce new data and practical results in terms of new breeding conditions and rabbits management.

The aim of this work is to study the integrated effect of probiotic "Rescue Kit" on productive qualities of early developed rabbits as well as to determine the level of their uptake as an additive in compound animal feeding stuffs.

MATERIALS AND METHODS

Research area and animals description

Research on effects of probiotic on the growth and development of young early developed rabbits and the identification of optimal doses of preparation was carried at the breeding farm "Astana-MIAKRO" on "White Giant" (WG) and "Soviet Chinchilla" (SCh) purebred rabbits as well as their hybrids (SCh×WG). When studying the effect of probiotic "Rescue Kit", 3 control and 6 experimental groups were formed. The 1st group was receiving the probiotic with the feeding staffs in amount of 5 g/kg, while 2nd experimental group was receiving 10 g/kg of feed. Both experimental groups were receiving feeding staffs with the appropriate probiotic starting at the age of 70 days during 120 days (i.e. until slaughter). The control group did not receive probiotics.

The “White Giant” (WG) is a large animal with a strong elongated body, straight long back, well developed chest, small head and straight medium size ears. They possess strong body tympanum of intermediate type, though often are found with a narrow body of a shallow-bodied type. Epy color is pure

white (albinos) with high pair density. The average live weight of adult animals is 4-5 kg, maximum weight is 6 kg. Body length is 55-60 cm, the chest girth behind the shoulder blades is 36-38 cm. Breeding power is 7-8 newborn rabbits in the brood. They are characterized by average prematureness. The average daily milk production of female rabbits is 170-220 g. Female rabbits possess good dam characters. Animals are unpretentious and well adapted to local conditions. They are often used in developing new breeds. When breeding, the focus should be made at improving the prematureness and fleshiness [7].

The "Soviet Chinchilla" (SCh) was bred in state fur farm of Saratov and Novosibirsk regions in collaboration with the Research Institute for Fur Farming and Rabbit Breeding under the guidance of N.S. Zusman. The breed was created by cross breeding the "White Giant" with imported "Chinchilla" breed. The goal was to increase body weight, improve the fur quality and increase the adaptation to different climatic conditions. Breeding of new variety was accompanied by rigid culling, selection of the best parents and paired couples. The breed was approved in 1963 and is characterized by high quality meat and fells. The animals have a strong body tympanum of wide-bodied type and well adapt to different conditions. The breed is widely distributed in the CIS countries [8]. The «Soviet Chinchilla» breed has a slender and broad body, small head with straight ears of medium size. Hair is soft, shiny, silvery-bluish and gray color. On the abdomen, neck, underside of tail and inside of the legs the hair coat is almost white. The rosette is characterized by five color zones: bluish grey, light grey, dark grey, white and black. The fells of «Soviet Chinchilla» are quite large with an attractive hairline and are used in their natural form. The average live weight of adult rabbits is 5 kg, body length is 50-57 cm, chest girt - 32-34 cm. The animals have a good breeding power, an average of eight newborn rabbits per breeding. They are characterized by high growing capacity; the newborn rabbits can reach 3.5 - 4 kg of live weight within 120 days. Slaughter yield reaches 56-63% of the live weight. To breed crossbred early developed rabbits we have used the «White Giant» and «Soviet Chinchilla» breeds [9].

The physiological parameters

The studies were conducted during the period from May to November 2015. In total, 220 clinical healthy young animals were used in the experiment from separating time to slaughter (120 days). In the course of the experiment, the animals of all groups ("WG", n=40, "SCh", n=30, "SCh×WG", n=40, as well as the control groups ("WG ", n=40, "SCh", n=30, and "SCh×WG", n=40) were kept in identical conditions and fed on a diet applying to the whole farm. Animals for the experiment were selected by the analog method in terms of origin, live weight, age, and sex. The indicators of live weight, measured by individual weighing of young early developed rabbits at the age of 70-, 80-, 90-, 100-, 110- and 120 days served the criterion to evaluate growth of the young animals. Clinical condition of early developed rabbits was monitored throughout the whole experiment, including the livability of animals before slaughter and the cause of mortality. Meat productivity of all experimental animals was assessed subsequent to the results of their slaughter for meat.

To study the effect of probiotic on nutrient digestibility of the feeding stuffs we have performed physiological metabolism trial. The digestibility and the accessibility of the feeding stuffs were determined by the direct method. In the course of the experiment, experimental animals of studied groups were given precisely metered amount of feed. Chemical composition of the ration, namely, the content of dry matter, crude protein, crude fat, fiber, ash and nitrogen-free extract (NFE) was analyzed. The amount of faecal output during the experiment was accurately measured to carry out its chemical analysis according to the same scheme. Based on the weight and chemical composition of feeding stuffs consumed by the animals and feces mass, the amount of consumed and eliminated nutrients was determined. The amount of substances digested and consumed by young animals was calculated based on the determined difference [10, 11].

In the experiment, the youngsters in each group were marked with special colored labels with individual numbers on the ears. Live weight of young early developed rabbits was determined using electronic scales (SEM-150-50/100, Russia).

Parasitological parameters

Faeces specimens for examination were taken at the age of 20 days until slaughter (120 days). When conducting the tests, clinical condition of the animal as well as number of oocysts in the microscope field before and after application of a probiotic were taken into account. The rabbits of the 1st experimental group were given feeding stuffs with added probiotic in the dose of 5g/kg, while rabbits of 2nd experimental group

were given probiotic at a dose of 10g/kg. Doe with newborn rabbits from the control group did not receive probiotic. All the young early developed rabbits treated with probiotic, were examined using Fülleborn's method every 20 and 30 days until reaching the age of 120 days for the presence of the endamebas [12]. Laboratory studies were performed at the laboratory of the S.Seifullin Kazakh Agro Technical University at the "Department of Parasitology" (Astana). Counting the number of oocysts was carried out using the microscope (MBS-10 with a hundredfold increase, made in Russia).

All the results obtained are presented with average values and standard deviations. The data obtained were processed using statistical software package SPSS Statistics 17.0.

RESULTS AND DISCUSSION

Variability of live weight during the study period was determined starting from the separating time of newborn rabbits from doe up to 120 days, i.e. before slaughter for meat. At the beginning of the experiment, at the age of 70 days, youngsters of each group were characterized by insignificant differences in live weight that indicated the methodological correctness of experimentation (Table 1). When weighing young rabbits, it was found that the animals in experimental groups were significantly superior to control animals in terms of body weight gain.

Table 1: Change in live weight of young early developed rabbits of "White Giant" breed, when using different doses of the probiotic (n=40).

Days	Control group	1st experimental group (RK-5 g/kg)	2nd experimental group (RK-10 g/kg)
	Live weight, g	Live weight, g	Live weight, g
70	2500±0.05	2480±0.05	2500±0.06
80	2780±0.06	2810±0.06	2850±0.06***
90	3080±0.07	3150±0.10*	3200±0.06***
100	3360±0.07	3440±0.09**	3520±0.07***
110	3670±0.07	3750±0.09**	3870±0.04***
120	3970±0.11	4050±0.09**	4210±0.05***

Note: P>0.05 *P≤ 0.05 **P<0.01 ***P<0.001

To carry out animal production performance tests, weighing of young early developed rabbits was conducted before the beginning of the experiment at the age of 70 days. Data on live weight of young early developed rabbits aged from 70 to 120 days, i.e. to until slaughter for meat, are presented in Table 1. At the beginning of the test, 70-day-old youngsters in all the experimental groups did not differ much in terms of their live weight. Though, gastro-intestinal tract diseases and death of early developed rabbits were monitored during the course of experiments starting from 70 day-old age up to 120 days. At that, two cases of digestive system diseases were noted in the rabbits of 2nd experimental group at the age of 80 days, while there was just one death loss and two cases of digestive disorder in the animals of the 1st experimental group, as well as two death losses and four cases of digestive system diseases in the rabbits of control group.

The differences in live weight of 90-day-old young animals in the 2nd experimental group were insignificant relative to the animals of the 1st experimental group. In relation to the control group, live weight of young animals of the 2nd experimental group was by 120 g higher.

The trend of greater gain in the 2nd experimental group of "White Giant" breed was continued in rabbits up to the age of 120 days. Thus, in terms of live weight, the young animals of the 2nd experimental group were superior to those of the 1st experimental group by 4%, and by 6% - to the rabbits of control group. When testing the rabbits of “White Giant” breed in terms of the gastrointestinal tract diseases and death losses, at the end of the experiment, i.e. at the age of 120 days, there were two death losses and two cases of digestive system disease in rabbits from the 2nd experimental group, while five death losses and three cases of digestive system disease were noted in the 1st experimental group. In the control group there were seven cases of death losses in young early developed rabbits and five cases of digestive disorder.

Young 70-day-old animals of all the groups of "Soviet Chinchilla" breed slightly differed in terms of live weight (Table 2). At the age of 80-90 days, live weight of rabbits in the control group insignificantly differed from those of animals in the 1st and 2nd experimental groups. Starting from the age of 100 days, the young animals of the 2nd experimental group began to increase rapidly in comparison with the control and the 1st experimental groups.

Table 2: Change in live weight of young early developed rabbits of "Soviet Chinchilla" breed,when using different doses of the probiotic (n=30).

Days	Control group	1st experimental group (RK-5 g/kg)	2nd experimental group (RK-10 g/kg)
	Live weight, g	Live weight, g	Live weight, g
70	2200±0.03	2193±0.06	2174±0.07
80	2503±0.03	2480±0.06	2460±0.06
90	2772±0.04	2800±0.06	2780±0.07
100	3060±0.06	3102±0.06	3142±0.09**
110	3340±0.07	3400±0.05*	3480±0.09***
120	3630±0.09	3720±0.06*	3800±0.08***

Note: P>0.05 *P≤ 0.05 **P<0.01 ***P<0.001

The live weight of 120-day-old youngsters in the control group amounted to 3630 g, whereas body weight of the rabbits in the 1st experimental group was 3720 g and in the 2nd experimental group - 3800 g, respectively.

At the end of the experiments on the gastro-intestinal diseases and death losses of early developed rabbits, just one death loss was noted in the 2nd experimental group, while in the 1st experimental group there were six death losses and one case of digestive disorder. In the control group, there were five cases of deaths of young early developed rabbits and four cases of the digestive system diseases.

When weighing crossbred rabbits at the age of 70 days at the beginning of the experiment in all groups, their live weight was almost the same and the difference was unreliable (Table 3).

Table 3: Change in live weight of mixed young early developed rabbits of "SCh×WG" pedigree,when using different doses of the probiotic (n=40).

Days	Control group	1st experimental group (RK-5 g/kg)	2nd experimental group (RK-10 g/kg)
	Live weight, g	Live weight, g	Live weight, g
70	2580±0.07	2600±0.04	2610±0.07
80	2880±0.06	2910±0.04	2920±0.06*
90	3180±0.06	3242±0.05	3261±0.07***
100	3490±0.05	3540±0.05*	3620±0.09***
110	3804±0.04	3864±0.04**	3980±0.09***
120	4120±0.04	4180±0.06**	4400±0.08***

Note: P>0.05 *P≤ 0.05 **P<0.01 ***P<0.001

The live weight of the 80-day-old young animals of the 2nd experimental group exceeded that of the animals in control group by 40 grams, and at the age of 90, 100, 110, and 120 days it was higher by 81, 130, 176, and 280 g, respectively.

Thus, youngsters of the 2nd experimental group at the age of 120 days were superior to the young animals of the 1st experimental group in terms of live weight by 5%, and by 7% – to those in control group. Considering gastro-intestinal tract diseases and the death losses of young animals during the experiment, there were four death losses in the 2nd experimental group and five deaths and two cases of digestive system

disease in the 1st experimental group. In the control group, eight deaths of young early developed rabbits and two cases of digestive disorder were registered.

This proves the fact that after separation of youngster rabbits from doe, the body of young animals is experiencing considerable stress that reduces their growth intensity, increases the susceptibility of the organism to infectious and preventable diseases. Thus, as a result of experiments, it was found that pathologies related to the gastrointestinal tract are the most common diseases typical for this period [13].

The chemical composition of the feeding stuffs does not give a complete idea about their nutritional value. The nutritional value of feed can be determined more precisely only in the course of studying its effect on the animal's organism. One such method could be the study of digestibility of feed. The digestibility means the ability of organic nutrients of animal feed to turn into utilizable condition under the influence of the processes occurring in the digestive tract of animals. Undigested feed substances along with some substances of gastric secretion, including non-adhered substances and products, excreted from the organism into the intestine, leave the organism in the form of extracts, i.e. feces [14].

Nutrient digestibility was determined by the difference between the substances received with feeding staffs and excreted with faeces. The rate of digestibility of feed nutrients was determined by the digestibility coefficient. Experiment on the study of feed digestibility consisted of preparation and reference periods. During the preparatory period the gastro-intestinal tract of early developed rabbits was liberated from the remnants of food from previous feeding. During the reference period, the daily amount of feed consumed and orts were registered, as well as the amount of excreted feces. Feces were collected in a special containers fitted for this purpose. After conducting the experiment to study digestibility of feed, corresponding analyses of feed, orts and feces were carried out to obtain all the necessary data needed for calculation of the digestibility of nutrients from investigating feeding stuffs.

To determine the digestibility of diet nutrients, physiological experiment was carried out. Nutrient digestibility was determined during 7 days. At that, 100 g of dry feed matter for the rabbits of control group contained 16.1 g of crude protein, 5.2 g of crude fat, 10 g of crude fiber, 65.6 g of NFE, and 3.1 g of crude ash.

Similarly, 100 g of dry feed matter for the rabbits of the 1st experimental group contained 17.4 g of crude protein, 7.6 g of crude fat, 8.3 g of crude fiber, 64.6 g of NFE, and 2.1 g of crude ash.

And finely, 100 g of dry feed matter for the rabbits of the 2st experimental group contained 18 g of crude protein, 8.1 g of crude fat, 5.2 g of crude fiber, 66.3 g of NFE, and 2.4 g crude of ash.

The digestibility coefficients of nutrients contained in compound animal feedstuff given to the rabbits of the control groups and that with the addition of probiotic "Rescue Kit" given to the rabbits of the experimental groups are shown in Table 4.

Table 4: Digestibility coefficients of feed nutrients consumed by young early developed rabbits of various experimental groups

Indicator	Consumed with feed, g			Digested, g			Proportion of consumed feed, %		
	Group								
	Control	1st exper. RK- 5 g	2nd exper. RK- 10 g	Control	1st exper. RK- 5 g	2nd exper. RK- 10 g	Control	1st exper. RK- 5 g	2nd exper. RK- 10 g
Dry matter	812	815	820	497	605	656	61.2	74.2***	80***
Crude protein	131	142	147.7	106	119	126	80.9	84.5*	85.31***
Crude fat	42	62	66.5	35	53	59	83.3	85.48*	88.72***
Crude fiber	82	68	92	11.9	16	34	14.5	23.52***	36.95***
NFE	532	514	494.2	332	399	424	62.4	77.18***	85.79***
Crude ash	25	29	19.6	12	18	13	48	53.52*	66.32***

Note: *P≤ 0.05 ***P<0.001

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Analyzing the data on the nutrients digestibility by rabbits in different groups, it should be noted that it varied by groups. Experimental groups had the advantage over the control groups. The digestibility in rabbits of the 1st experimental group was better as compared to the control group; in terms of dry matter – by 13%, crude protein – by 3.6%, crude fat – by 2.18%, crude fiber – by 9.02%, NFE – by 14.78%, and crude ash – by 5.52%. Similarly, for the animals of the 2nd experimental group with regard to control: dry matter – by 18.8%, crude protein – by 4.41%, crude fat – by 5.42%, crude fiber – by 22.45%, NFE – by 23.39%, and crude ash – by 12.8%. The best digestibility coefficients for dry matter, crude protein, crude fat, crude fiber, NFE, and crude ash were obtained for young rabbits fed with mixed fodder contained probiotic "Rescue Kit" in a dose of 10 g/kg of feed (Fig. 1).

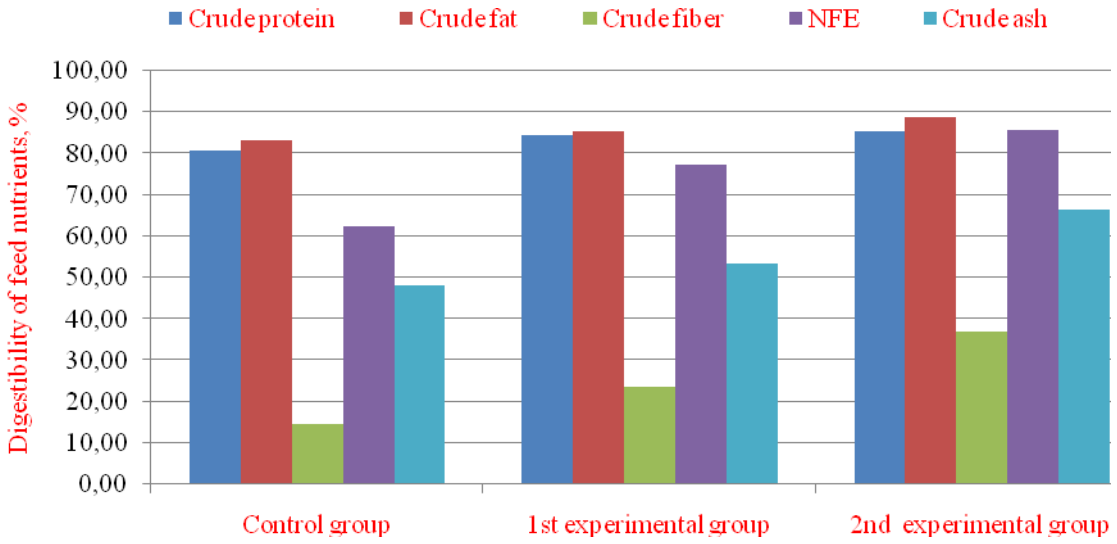

Figure 1: Digestibility dynamics of feed nutrients for young early developed rabbits.

Thus, it was revealed that probiotic supplement "Rescue Kit" added to the diet of young early developed rabbits in the amount of 10g/kg of feed, favorably contributed to the enhancement of metabolic processes, primarily on the digestion of feed nutrients that was reflected in higher digestibility coefficients of all studied feed components for young animals in experimental groups.

Separating time of young rabbits from doe is the most critical period in the rabbit breeding. According to "MIAKRO" technology, the young rabbits up to 70 days of age are fed by mother's milk, and this improves the viability of young animals. Though, worth noting that at 45 days after breeding, milking capacity of doe sharply decreases.

During this period, youngsters begin to feed independently with compound animal feedstuff. Separation of young animals from the doe puts a lot of stress on the organism of young animals and can cause serious disturbances in the body such as reduced growth and development, production loss and diseases of different etiology. At improper feeding and management of young animals after being separated from doe, they become easily susceptible to gastrointestinal diseases. Therefore, because the separation is an important stage in the development of young animals, it must be approached with the proper attention. Young rabbits are growing especially hard when fed with mother's milk. After separation from doe at the age of 70 days, they slow down in growth and sometimes even die [15].

In this regard, in recent years, there is an increased interest in probiotic supplements, namely, their ability to treat and prevent diseases of the gastrointestinal tract and to restore normal intestinal flora. Probiotics should be considered as the possibility to fulfill the potential of the animals, maintain their health and receive a high quality product, safe in terms of bacterial and chemical content. The probiotics contain typical normal microflora of thick intestine of animals such as lactic acid bacteria playing a huge role in protecting the intestinal wall. Unlike antibiotics, probiotics in terms of their effect are aimed at competitive exclusion of opportunistic pathogenic bacteria from the intestinal microbiota. Probiotics are not addictive by pathogenic microorganisms [16].

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Analyzing the results of carpological analysis of faeces of young rabbits of the "White Giant" breed at different ages, it was revealed that the reproduction of Eimeria mainly occurs in large intestine and rarely in small intestine of the gastrointestinal tract. All rabbits administrating probiotics were examined for protozoa using Fülleborn's method every 20 and 30 days during the whole test period of 120 days (prior to slaughter) (Table 5).

Table 5: Quantitative indicators of Eimeria oocysts in the faeces samples of early developed "White Giant" rabbits of different ages.

Indicator	The amount of excreted oocysts in faeces samples		
	Control	1st experimental group	2nd experimental group
Number of doe/rabbits in the group, units	6/46	6/48	5/44
20-day-old	-	-	-
40-day-old	18	12	5
70-day-old, separated from doe	25	16	6
90-day-old youngsters	12	8	2
120-day-old	6	4	1
Number of live 4-month-old rabbits, units	37	43	42
%	80	89	95

As shown by the research results, in 20-day-old rabbits of "White Giant" breed, both in control and experimental groups, no Eimeria oocysts were detected in feces samples. At 40-day-old animals in control group, 18 Eimeria oocysts were found in 20 microscope fields (Figure 2).

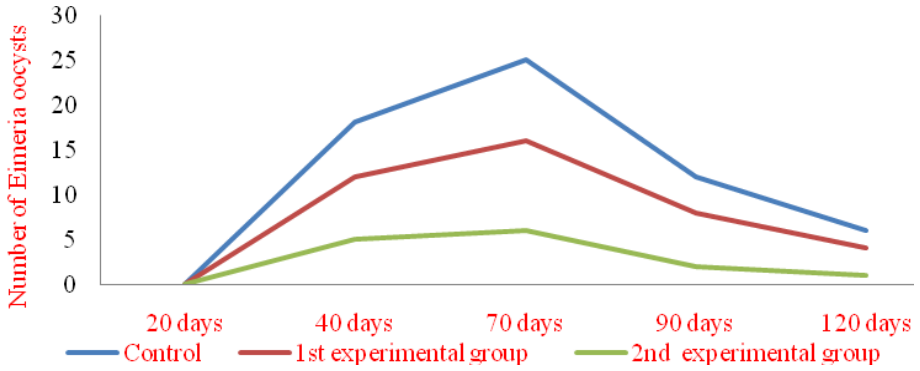

Figure 2: Infestation dynamics of the "White Giant" breed rabbits with Eimeria oocysts.

Infestation rate in the following days was, respectively, 25 Eimeria oocysts in 70-day-old rabbits, 12 oocysts in 90-day-old rabbits, and 6 oocysts in 120-day-old animals. In 70-day-old rabbits, infestation rate after being separated from doe has increased by 38%.

At the age of 90-120 days, the infestation of rabbits with Eimeria oocysts declined just due to death losses in young animals. During the study period nine deaths were recorded in the control group. In 40-day-old rabbits of the 1st experimental group, the number of detected Eimeria oocysts in faeces samples was – 12, while the number of oocysts in the 70-day-old rabbits was 16, at 90 days of age – 8, and at 120 days of age – 4. At that, the Eimeria oocysts were observed in 20 microscope fields. At the age of 70 days after separation of young rabbits from doe, the infestation with Eimeria oocysts increased by 33%. However, at 90 days of age infestation rates have decreased by 50%. In the 40-day-old rabbits of the 2nd experimental group, 5 Eimeria oocysts were detected in 20 microscope fields, while in 70-day-old rabbits this figure increased by 20% (Table 6).

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Table 6: Quantitative indicators of Eimeria oocysts in the faeces samples of early developed rabbits of the «Soviet Chinchilla» breed at different ages.

Indicator	Number of detected Eimeria oocysts in the faeces samples		
	Control	1st experimental group	2nd experimental group
Number of doe/rabbits in the group, units	5/30	5/28	5/32
20-day-old	2	-	4
40-day-old	32	18	1
70-day-old, separated from doe	40	24	2
90-day-old youngsters	22	10	-
120-day-old	15	6	-
Number of live 4-month-old rabbits, units	23	24	30
%	76	85	97

Just single oocysts were detected in the faeces samples of the 90-120-day-old rabbits treated with probiotic at a dose of 10 g/kg of feed. The survivability of rabbits by the age of 4 months amounted to 80% in the control group, 89% - in the 1st experimental group, and 95% - in the 2nd experimental group.

As a result of studying the effectiveness of probiotic preparation "Rescue Kit" in the treatment of eimeriosis in rabbits, it was found that at a dose of 10 g/kg of feed, the probiotic inhibits endogenous development of Eimeria and provides a long-term coccidiostatic effect. Before the experiments, rabbits' faeces samples were examined for the availability of Eimeria oocysts. It was found that the number of oocysts in the feces of animals observed in the microscope field ranged from 0 to 4. Twenty days after application of probiotic preparation the intensity of infestation in rabbits of the 2nd experimental group decreased significantly, while in the 1st experimental group and the control group, starting from the age of 40 days, the amount of excreted Eimeria oocysts in the feces sharply increased (Figure 3). Sick rabbits malnourished and had organomegaly of belly.

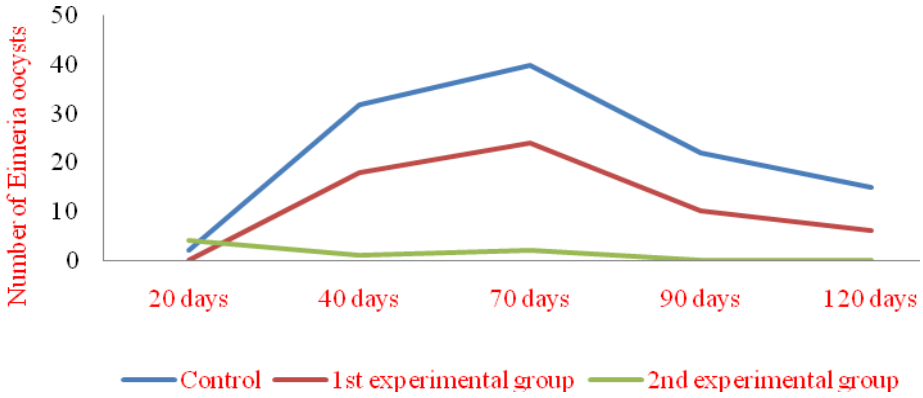

Figure 3: Infestation dynamics of the «Soviet Chinchilla» breed rabbitswith Eimeria oocysts.

Number of oocysts found in 20 microscope fields ranged from 18 to 32. By the age of 70 days, in the rabbits from the control and the 1st experimental groups the number of Eimeria oocysts detected during the carpological study of the excretions, reached up to 24-40 in 20 microscope fields. During this period, 7 young rabbits were lost through death in the control group, 4 rabbits - in the 1st experimental group, and 2 rabbits - in the 2nd experimental group. All the lost animals had characteristic clinical and pathological signs of eimeriosis. In the 2nd experimental group after separating of young 70-day-old rabbits from doe, a slight increase of the Eimeria oocysts was revealed during the feces analysis (Fig. 4). At that, no oocysts were found in feces specimens during the subsequent days.

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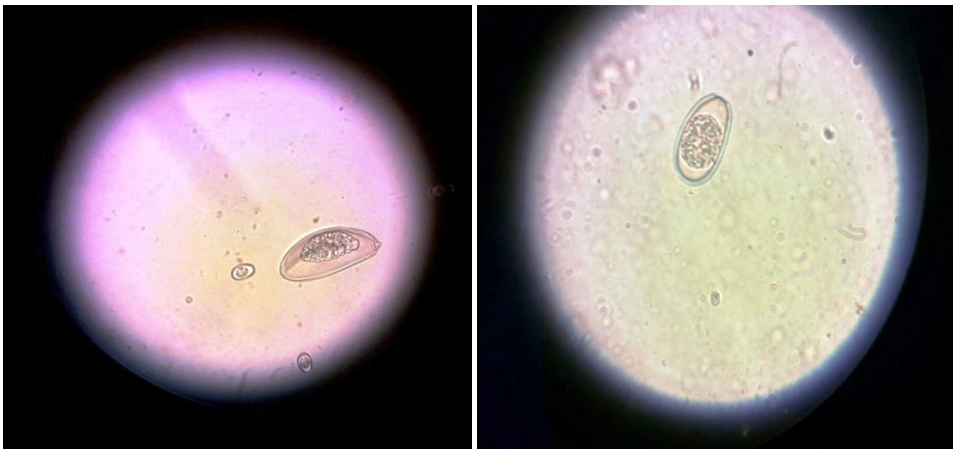

Figure 4: The Eimeria oocysts detected in feces samples of the rabbits.

The survivability of 4-month-old young rabbits amounted to 76% in the control group, 85% in the 1st experimental group, and 97% in the 2nd experimental group.

Thus, the studies conducted have shown that administration of probiotic "Rescue Kit" at a dose of 10 g/kg of feed has preventive efficacy against eimeriosis in early developed rabbits, while at the dose of 5g/kg of feed the preparation shows weak coccidiostatic efficacy.

CONCLUSION

Based on the obtained results, we can conclude that the use of probiotic preparation "Rescue Kit" in the diet of young rabbits during the fattening period has a positive effect on the animals' body gain and contributes to effective production of dietary rabbit meat.

As shown by the research outcomes, the probiotic stimulates the activity of the gastrointestinal tract, normalizes metabolic processes in the organism of young animals that results in increased animal performance and survivability, as well as enhances efficiency of meat production.

It is ascertained that probiotic supplement "Rescue Kit", added to the diet of young early developed rabbits in the amount of 10 g/kg of feed, contributes to the enhancement of metabolic processes, primarily the digestion of feed nutrients that is reflected in higher digestion coefficients of all studied feed components. This was proved by the experimental data obtained for the rabbits of the 2nd experimental group.

The research results show that during the warm period of the year there are optimal conditions (temperature and humidity) for rapid maturation of Eimeria oocysts to the infestation stage that sharply increases the risk of young rabbits infestation with eimeriosis. In addition, stress caused by separation of young rabbits from doe, as well as their deprivation of mother's milk, dramatically reduces the overall resistance of an animal's organism against diseases.

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