белок пен иммуноглобулиндердің мөлшерін айтарлықтай жоғарылататындығы тәжірибе жүргізу барысында анықталды.

Кілт сөздер: гипофизарлық цитотоксикалық қан сарысуы, иммунитет, резистенттілік, иммуноглобулиндер, жалпы белок.

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INFLUENCE OF PITUITARY CYTOTOXIC SERUM ON THE DINAMICS OF IMMUNOGLOBULIN COMPOSITION OF BLOOD SERUM OF CALVES

Annotation

Introduction calves stimulating the pituitary cytotoxic dose of the serum markedly activates humoral factors of nonspecific resistance of the organism calves, as evidenced by a significant increase of the quantitative values of total protein and immunoglobulins in the blood serum.

Key words: Pituitary cytotoxic serum, immunity, resistance, immunoglobulins, total protein.

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THE IMPACT OF FUNCTIONAL FEED ADDITIVES TO CHICKENS

Annotation

This study was designed to investigate the influence of basic diets supplemented with a clay product of zeolite on growth performance and hematologic indices in broiler chickens. In experiment 1, 21 one-day-old chickens were randomly divided into 3 groups with 7 chickens each. In experiment 2, 21 one-day-old male chickens were randomly allocated into 3 groups consisting 7 chickens each. The diets were fed from 1 to 42 days of age. The results showed that zeolite supplementation could increase body weight gain and hematologic indices. The apparent digestibility values of crude protein and gross energy were significantly increased by zeolite.

Key words: broiler, growth performance, hematologic indices, zeolite, feed additives.

Introduction

In the poultry industry, feed additives and antibiotics have been used worldwide more than 50 years to enhance growth performance as well as to prevent infection of pathogens and disease [1, 2].

According to establishments of British scientists S. Davis and M. Dryden, in Europe more than 25 thousand people dead from antibiotic resistant to antibiotic treatment annually. And further, the situation will be worse. In 20 years, new strains of tuberculosis and *Escherichia coli* become incurable. It is no accident that the last class of antibiotics was developed about 30 years ago; scientists understood the hopelessness of this path. Uncontrolled use of antibiotics in pursuit of high results leads to the resistance of pathogenic and opportunistic microorganisms to antimicrobial agents, which is a time bomb for humans and leads to a significant deterioration in the quality of food. World Health Organization (WHO) report for 2013 shows that there are countries in which up to 50% of the population does not respond to antibiotics in the treatment of many bacterial diseases [3].

In developed countries of Europe, since 1997, the use of antibiotics in animal feeding has been restricted, and since 2006, 8 countries have completely banned their use as growth stimulants. Sweden stopped using them since the late 1980s. During this period, this country has become the only one where poultry meat is received without salmonella [4].

The silicate minerals such as zeolite, attapulgite, kaolinite, smectite, and sepiolite are found to be effective as non-toxic, cheap, ecologically advantageous and affordable materials based on their high-sorption capacity and ion exchanges properties. So they are widely used in many fields of industry, agriculture, environment protection, sanitation, veterinary medicine, and animal nutrition [1-3]. The zeolite of Ca, Mg, Fe, Na and other macro-microelements is rich. Having ion-exchange properties, it gives these elements to the body of animals and birds. The main types of natural zeolites are used in poultry farming, veterinary medicine, food preparation and medicine: 1) ion exchange and 2) adsorption [5].

Zeolites are crystalline, hydrated aluminosilicates consisting of three-dimensional networks of $SiO_{2/4}$ and $AlO_{2/4}$ tetrahedral, linked by the sharing of oxygen atoms [6]. They have the ability to exchange constituent cations without major change of structure and to lose and gain water molecules reversibly. It has been reported that zeolites contains lots of major and trace elements which are essential for the growth of aquatic animals, livestock and poultry. These elements are in an ionic state and can be released to these animals for improving their health conditions [7].

Several studies have proved the non-toxicity of zeolites for laboratory animals: in the amount of 5% on digestion processes confirmed the positive effect on the digestibility of feed [8].

Analysis of anatomical and morphological data showed significant changes on the part of the digestive tract. The laying hens that received the zeolite showed an increase in the length of the intestine, as well as a sharp increase in the mass of the liver and heart. An increase in the mass of the intestine when feeding similar natural aluminosilicates is noted by a number of authors. Analyzing the data of the relative mass of the digestive organs to the body weight, there was also an increase in the intestinal mass in the males that received 1-5% zeolite in the diet. The maximum increase was 16.7% in the group of males, who received 3% zeolite from the main diet [9].

Positive data obtained by feeding zeolites can be interpreted as a consequence of the adsorption capacity of zeolites over ammonium ions and other ions. The adsorption mechanism removes excess liquid from the gastrointestinal tract, prevents diarrhea and indigestion, changes the acidity of the environment, and so on [10].

According to the histological study, it was found that the increase in the thickness of the intestinal wall was due to the muscular membrane. In the group of males that received 3% zeolite, the thickness of the muscle shell was greater than in the control. Based on the obtained data, the hypertrophy of smooth muscle cells should be considered the main and most important phenomenon in the process of compensation of the muscular shell for the introduction of different concentrations of zeolite [10].

The aim of this study was to examine the impact of basal diets with adding a clay product of zeolite on growth and hematologic indices in broiler chickens.

Materials and methods

Birds used in this research were purchased from a commercial hatchery of poutry farm Allele-Agro and were kept in a room of the vivarium of Veterinary Department of Kazakh National agrarian university. In total were twenty one one-day-old healthy male Arbor Acres broiler chickens with an average initial body weight of 46.29±0.16 g (mean±standard error of the mean [SEM]). Chickens were randomly allocated into three groups consisting of seven chickens in each.

The zeolite used in this study was provided by «Taza-Su» organization (Almaty, Kazakhstan). All birds were fed with a starter diet from 1 to 21 days followed by a grower diet

from 22 to 42 days. The ingredients and nutrient levels of basal diets were formulated to meet the NRC (1994) nutrient requirements of broiler chickens. The control group was fed with maize-soybean basal diets. The first experimental group was given a basal diet with the addition of 2% zeolite and the second experimental group was given a basic diet with the addition of 1% zeolite.

The birds were placed in wire cages in a three-level battery and housed in a room, which was controlled at a brooding temperature of 35°C from 1 to 3 days and then gradually decreased to 22°C by 1°C to per 2 days. Continuous light was maintained during the whole experimental period. Birds were allowed free access to mash diets and water. At 21 and 42 days of age, one bird per cage was randomly selected and weighed.

The blood samples were taken from a wing vein puncture and serum were separated by centrifugation at 3,900×g for 15 min at 4°C. Serum samples and blood were analyzed on the Automatic Hematologic Analyzer MS 4/5. Studies of hematological and biochemical parameters of blood serum and blood of chickens were conducted in the laboratory "Green Biotechnology and Cell Engineering" of Kazakhstan-Japan innovation center.

Results and discussion

Hematologic parameters in all groups corresponded to physiological norms for chickens of diurnal and twenty one days old. As shown in table 1, biochemical parameters of blood serum of chickens in both experimental groups were higher compared to the control group.

Table 1. Hematological and biochemical parameters of blood serum of chickens

Index	Unit of measurement	Groups, (m± SEM)		
		Control	1st experimental	2nd experimental
Hemoglobin	g/L	57.1±0.19	59.6±0.19	58.4±0.18
Number of erythrocytes	10^{12}/L	3.3±0.12	3.5±0.11	3.4±0.10
Hematocrit	%	33±0.14	37±0.17	36±0.16
Total protein	g/L	32.1±0.32	35.2±0.27	33.6±0.31
Calcium	mmole/L	2.43±0.14	3.21±0.11	3.12±0.12
Phosphorus	mole/L	1.03±0.01	1.32±0.02	1.21±0.02

In all experimental groups was observed an increase in hemoglobin level, the maximum level was detected in the first experimental group (59.6±0.19 g/L). The number of erythrocytes is also higher in the experimental groups than in the control. In first experimental group the number of erythrocytes was $3.5\pm0.11*10^{12}$/L, in second experimental group the number of erythrocytes was $3.4\pm0.10*10^{12}$/L, while in control group this parameter showed $3.3\pm0.12*10^{12}$/L. The maximum increase is observed in the first experimental group. The content of total protein in first experimental group was 35.2±0.27 g/L, which was higher than in control (32.1±0.32 g/L) and second experimental groups (33.6±0.31 g/L).

The results of biochemical parameters (the content of minerals) in experimental groups, which received 2% zeolite in addition to basic diet, were higher compared to control group. The content of calcium in second experimental group was 3.12±0.12, which is in average greater for 0.69 mmole/L. The maximum indices showed in first experimental group (the content of calcium was 3.21±0.11 mmole/L and the level of phosphorus -1.32±0.02 mole/L).

Some decrease in chickens' safety in the first experimental group can be explained by the fact that the use of zeolite mineral additive is recommended from 10-15 day old age for agricultural birds. Hematologic indices in the first and second experimental groups have a significant increase with respect to control. This proves the high biological activity of zeolite.

Conclusion

According to the results obtained, it can be argued that 2% supplement of zeolite favorably influences the hematological indicators of the claws. These improvements are achieved due to the normalization of the intestinal micro flora and the properties of ion exchange of zeolite. Proceeding from the received data and considering that the mineral additives of zeolite are cheap, natural and safe food additives, it is possible to recommend the use of zeolite in poultry farming.

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ВОЗДЕЙСТВИЕ ФУНКЦИОНАЛЬНЫХ КОРМОВЫХ ДОБАВОК ДЛЯ ЦЫПЛЕНОК

Аннотация

В данной работе были исследованы влияния базовых диет, дополненных цеолитом на показатели роста и гематологические показатели у цыплят-бройлеров. Результаты показали, что добавка цеолита может увеличить гематологические показатели. Значительные показатели усвояемости сырого белка и общей энергии были увеличены цеолитом.

Ключевые слова: бройлер, производительность роста, гематологические показатели, цеолит, кормовые добавки.

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ТАУЫҚ ҮШІН ФУНКЦИОНАЛДЫҚ ЖЕМ ҚОСПАЛАРЫНЫҢ ӘСЕРІ

Аннотация

Бұл жұмыста цеолитпен байытылған диетаның бройлер тауықтарының өсу және гемотологиялық көрсеткіштеріне әсері зерттелген. Нәтижелер диетаға цеолитті қосу көрсеткіштердің жоғарылауына алып келуі мүмкін екенін көрсетті. Нәруыздың және жалпы энергияның сіңірілуі цеолитпен айтарлықтай артты.

Кілт сөздер: бройлер, өсу өнімділігі, гематологиялық көрсеткіштер, цеолит, жемшөп қоспалары.

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КРАЕВЫЕ ОСОБЕННОСТИ ЭПИЗООТОЛОГИИ СИБИРСКОЙ ЯЗВЫ И ГЕОИНФОРМАЦИОННЫЕ КАРТОГРАФИРОВАНИЕ СИБИРЕЯЗВЕННЫХ ЗАХОРОНЕНИЙ НА ТЕРРИТОРИИ КЫЗЫЛОРДИНСКОЙ ОБЛАСТИ

Аннотация

В статье приведены результаты анализа эпизоотической ситуации по сибирской язве животных и геоинформационных картографировании сибиреязвенных захоренении на территории Кызылординсой области РК.

Ключевые слова: Сибирская язва, очаг, неблагополучный пункт, скотомогильник, мониторинг.

Введение

На территории Республики Казахстан среди сельскохозяйственных животных ежегодно регистрируется более 30 случаев заболевания сибирской язвой. Иногда отмечают заражение этой инфекцией и людей. В целях профилактики сибирской язвы проводятся ежегодные профилактические прививки животных. Однако, эти меры до настоящего времени не улучшили эпизоотическую ситуацию по болезни [1, 2]. Наиболее восприимчивыми к сибирской язве считаются домашние животные – КРС, овцы, буйволы, лошади, ослы, олени и верблюды. Источниками возбудителя инфекции являются больные животные. Факторами его передачи – трупы животных, контаминированные этим возбудителем, почва, корма, вода, навоз, подстилка, предметы ухода за животными, сырье и продукты животного происхождения. Переносчиками возбудителя могут быть плотоядные животные, птицы, кровососущие насекомые [3, 4].

Сибирская язва относится к почвенной инфекции, поэтому заражение происходит чаще на пастбищах алиментарным путем и регистрируется чаще всего в летний период, реже зимой при поедании животными инфицированного корма. Отмечается стационарность болезни. Эпизоотическая ситуация по сибирской язве животных в отдельных регионах РК, в том числе Кызылординской, области, остается не достаточно изученной.