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CHITOSAN AND STUDY OF PHYSIOLOGICAL AND BIOCHEMICAL INDICATORS OF BROILER CHICKS FEEDING WHEY POWDER (Review article)

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Abstract:
A number of decrees of the President of the Republic and decisions of the Cabinet of Ministers have defined the better satisfaction of the needs of the population of our republic as a major economic and political issue.
We know that poultry (chicken breeding) has been developing rapidly in recent years in our republic, therefore our research is accelerating. Until now, no scientific researches have been conducted in our republic in the direction of chickens fed with whey enriched with chitosan.

Keywords: Chitosan, chitin, protein, amino acid, broiler, poultry, feed, whey powder, biopolymer.

Introduction

Today, in our republic, as in all countries, the development of poultry farming is considered an important factor in ensuring food security, and the sector has an incomparable role in providing the population with dietary poultry meat and egg products rich in proteins and vitamins. The dry and warm climate of Uzbekistan is favorable for keeping and raising poultry.
Biopolymer “Chitosan” of natural origin, as well as its use as an immunostimulant - a tool that increases the productivity of broiler chickens and improves the quality of broiler poultry products - is of great scientific interest. Chitosan is a polysaccharide natural polymer that is one of the most common organic compounds in nature. The most common sources of its production are crustacean shells (crabs, mulberry silkworms, etc.).
“Chitosan” biopolymer has properties such as high sorption capacity, non-toxicity, ability to heal wounds, anticoagulant, bacteriostatic and antitumor activity.
One of the foods is whey powder. Whey protein has the amino acid set necessary for poultry. An important feature of milk proteins is their ability to be easily absorbed by the body's digestive system. Whey proteins can serve as an additional source of

arginine, histidine, methionine, lysine, threonine, tryptophan. Whey is a relatively good source of calcium and phosphorus.

Optimum doses of dietary supplementation at different stages of growth have not been determined, and therefore, its effects on physiological status, productivity, product quality, and economic efficiency cannot be clearly understood.

The Purpose of the Study

Analysis of scientific literature data of our Republic, CIS and foreign scientists dedicated to the development of measures to improve the physiological and biochemical indicators of poultry farms and among poultry under the care of the population.

Literature Review

Some polysaccharides, including chitosan, are attractive for nutritional use due to their properties. Chitosan, when introduced with food, is able to be enzymatically degraded and assimilated in the form of compounds of low molecular weight. Chitosan oligomers act on non-specific resistance factors that stimulate the immune system [1].

The history of research on chitin and chitosan goes back about 200 years (chitin was discovered in 1811, chitosan in 1859). Chitosan and preparations based on it are successfully used in veterinary medicine to treat diseases of farm animals and poultry and increase their productivity [2].

Information on the role of biologically active substances of natural origin in increasing the efficiency of complete feeding of broiler chickens is detailed, and scientific development of methods for activating the immune system and metabolic processes in the industrial production of broiler chickens is proposed [3].

Characteristics of evaluated cultures of microorganisms identified in studies on reducing the content of toxic elements in poultry products are of great practical importance. At the same time, as a result of the implementation of the proposed recommendations in production, the profitability of poultry meat production will increase up to 1.5%. The obtained results can be used in the educational process in zootechnics, physiology and nutrition courses [4].

In this article, the possibility of creating non-traditional feed additives for poultry from microalgae of the genus chlorella and chitosan is considered. A balanced diet of farm animals can reduce their morbidity, increase their weight and increase milk production [5].

The issues of increasing crude protein content and improving amino acid content in biomass remain open and require further research. In addition, it is of scientific and practical importance to study the effect of this protein on the physiological and productive indicators of broiler chickens. The aim of the work is to develop a method of obtaining alternative feed protein with high crude protein content and improved amino acid content [6].

Structurally homogeneous biocompatible and biodegradable composite materials were obtained based on mixtures of high strength chitosan with 8-block copolymers of D, L-lactide chitosan (Patent RU 2540468). Blended composites of chitosan with D, L-lactide block copolymers are promising as biomedical materials for covering wound surfaces [7].

The results of the study of the effectiveness of the use of the new "SBT-Lacto" probiotic feed additive in the broiler chicken diet are presented. As a result of the tests, it was found that the studied microbial feed additive helped to increase the safety of broiler chickens by 8.0%, increase live weight by 7.0%, and reduce feed conversion by 1.2%. Probiotic has a stimulating effect on the normal flora of the gastrointestinal tract of poultry, which is characterized by an increase in the level of lactobacilli and a decrease in the microflora titer [8].

The effect of BS feed additive on liver condition of broiler chickens was studied. Histological examination and comparative examination of the processes occurring in the liver during the use of BS feed additive revealed a complex of physiological, compensatory and pathological processes in control and experimental chickens [9].

Breeding of broilers worldwide is based on the use of high-yielding crosses created by breeders and geneticists. To date, the search for various feed additives that maintain the normal physiological state of birds, prevent the development of diseases, accelerate growth without harming their health, and increase their productivity by influencing the intensity of reproduction of genetic information [10, 11] is underway.

The effect of methionine and whey powder on storage parameters, average total weight, distribution of broilers by categories and chemical composition of meat was studied. When adding methionine to the basic diet, the survival rate of chickens and roosters increased by 0.3%, the average weight of chickens increased by 10.03% after 30 days, and roosters by 6.25% after 60 days [12].

Studies on the use of high-protein feed additives for the production of broiler chickens from the secondary raw materials of "organic" processing industries were conducted and the optimal rates were determined and their effects on the growth, development and meat quality of the birds were studied [13].

It has been shown to increase productivity, normalize metabolism and stimulate non-specific resistance factors in chickens [14].

Chitosan drug helps to increase productivity of broiler chickens, normalizes metabolism and natural resistance [15].

The studied chitosan preparation was found to increase protein content and reduce fat content in duck meat [16].

Numerous scientific studies and production experience show that the full realization of the genetic potential of poultry can be achieved through the wide use of biologically active substances and feed additives of natural origin. Chitosan, which has a number of positive properties, can be used for this purpose [17, 18].

When Hisex White chickens were fed acid-soluble or water-soluble chitosan succinate, there was higher poultry production and safety compared to the control group. However, administration of the acid-soluble form had a more dramatic effect on the increase in live weight and removal of heavy metals from the body of laying hens [20].

Taufik SA, Hamadi SM studied the feasibility of using whey powder as part of a compound feed for broiler chickens. For the chickens of the experimental groups, 3.5 and 10% dry whey was added to the feed instead of feed yeast and corn and wheat grains. The birds in the control group were fed a standard feed enriched with trace elements and vitamins based on existing recommendations. The inclusion of 3 and 5 percent dry milk whey in the composition of dry feed helps to increase the live weight of chicks and reduce feed costs [21, 22, 23].

Currently, various ingredients are included in the diet as nutritional supplements. Whey has been studied in poultry diets [19] and based on it, skimmed milk powder enriched with microbial proteins and vitamins has been obtained [26, 27, 28].

Whey is not used in sufficient quantities for feed due to its difficult-to-digest disaccharide lactose (85% of dry matter), which results in the bulk of it being spilled and polluting the environment. It is known that when one cubic meter of whey falls into water, it destroys 1000 m3 of water. In this regard, the development of simple and advanced methods of whey processing allows to expand the production of valuable feed [24, 25, 29, 30, 31].

A special place should be given to the possibility of using whey in some formulas of whole milk substitutes, which allows to save an equivalent amount of skimmed and whole milk for food purposes and at the same time obtain a product with a high nutritional value [32, 33].

Conclusions

According to the analyzed literature, the inclusion of chitosan and whey powder in poultry feed can achieve good results. The main thing is that these substances are made in the form of a mixture with other high-protein components, and the synthesis of these substances on an industrial scale prevents environmental pollution.

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