

Effect Of Chitosan and Whey Powder on The Physiological Status of Broiler Chicks Fed

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Abstract. Today, in our republic, as in all countries, the development of poultry farming is considered an important factor in ensuring food security, and the industry 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.

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

Introduction. "Chitosan" biopolymer has properties such as high sorption capacity, non-toxicity, ability to heal wounds, anticoagulant, bacteriostatic and antitumor activity. It is also a good flocculant, emulsifier, thickener and structure builder. The wide possibilities of using chemical modifications of chitin and chitosan to obtain materials with different structures and properties make these polymers one of the most interesting types of raw materials [1].

At present, more than 100 fields of application of the drug "Chitosan" and its derivatives are known, including recently obtained micro- and nanochitosans [2]. The problem of mycotoxicoses is so important today that it undoubtedly requires the justification of a strategy for the prevention and elimination of toxins along the entire chain - from the field to humans [3].

Recently, a low-cost product, whey, has been attracted to the growth of quantitative mass production. It is a by-product obtained during the production of cottage cheese, cheese, milk and other dairy products. Its production in the circular economy system encourages more and more producers to process whey, which generates additional income and creates internal sources of food resources. Whey is the richest food product [4, 5].

The development of ways to reduce the cost of food rations can be solved by expanding the range of input components by using secondary products of the food industry [6, 7].

Purpose of work- study of the effect of biopolymer chitosan + dry whey on the physiological and biochemical parameters of broiler chickens.

Research materials and methods. Research and production experience to develop optimal doses and evaluate the effect of Chitosan + whey powder preparation on the safety and quality of broiler chicken products was carried out in the conditions of the generally accepted vivarium method. The subject of the study was Cobb broiler chickens. 100 chickens participated in the experiment. Broiler chickens were fed with "Super Don" feed. The supplement was added to the diet from the age of 7 days along with drinking water, after dissolving the biopolymer in a 2% solution of acetic acid. In the last decade of life, the use of premix for broiler chickens was carried out to remove toxic feed components and antibiotics from the body. In order to control the development of experimental chickens, taking into account their safety, they were weighed at the age of 28 days and at the end of the experiment (at the age of 42 days). During the experiment, the chickens of the experimental and control groups were monitored for their clinical status, safety, and weight gain. In 3, 4, 5 and 6 weeks, blood samples were taken and physiological and biochemical indicators were determined. To determine the toxic effect on the body of broiler chickens, the liver and kidneys of different doses of premix

were taken for histological study. The material was fixed in 10% formalin solution, then embedded in paraffin by traditional methods [8, 9, 10].

Physico-chemical research was carried out according to the decision of the Cabinet of Ministers of the Republic of Uzbekistan No. 36 of January 22, 2018 "On the safety of meat and meat products" according to the following indicators: - reaction to ammonia and ammonium, salts (the method depends on the ability of ammonia to form from ammonium salts with a reagent is based on, Nessler mercurammonium iodide is a yellow-brown substance); peroxidase reaction (the method is based on the ability of peroxidase to oxidize benzidine in the presence of hydrogen peroxide and color the solution blue-green); - acid number of oil (the method is based on dissolving oil with a mixture of diethyl ether and ethyl alcohol and titrating free fatty acids with potassium hydroxide); - peroxide value of oil (the method is based on treatment of oil with a mixture of acetic acid and chloroform with potassium iodide solution and titration of free iodine with sodium sulfate solution); - pH (the reaction of the poultry meat medium was determined by the potentiometric method using the "pH METER HANNA 9025" device in the aqueous extract of meat prepared in a ratio of 1:10) [11, 12, 13].

Determination of moisture content of meat was determined by weight loss during drying of test samples (GOST 9793-74. "Meat products. Methods of moisture determination"). The study of its chemical composition (fat, ash, protein) was conducted according to GOSTs: 23042-86, 31727-2012, 25011-81.

The relative biological value and toxicity of meat was determined according to the "Guidelines for the toxicobiological evaluation of meat, meat products and milk using ciliates of *Tetrachymena piriformis*".

Bacteriological studies of poultry meat GOST 7702.2.0-95 "Poultry meat, poultry by-products and semi-finished products. Sampling methods and preparation for microbiological studies. In addition to bacterioscopy of the smears, inoculations were carried out in liquid and solid nutrient media.

All obtained experimental digital materials were subjected to statistical processing on a computer using the "Microsoft Excel-2007" program.

Research results and discussion. Feeding the premix to chickens had a positive effect on the growth and development of broiler chickens, which is evidenced by the positive dynamics of hematological and biochemical indicators.

Studies have shown that broiler chickens in the 3rd experimental group were characterized by high growth intensity during the experiment. The average daily growth in it was 51 g (in the control - 45.1 g). The largest live weight of birds in the group was in experimental group 3. It was 0.8 and 4.6% higher than other experimental groups and was 2182 g.

The next stage of the research was to study meat quality parameters after feeding broiler chickens with premix. Bacterial contamination of poultry meat is one of the most important parameters describing the sanitary condition of slaughter products. Microorganisms can not only deteriorate the organoleptic characteristics, but also make the meat unfit for food purposes and even dangerous for human health. Hygienic standards for microbiological indicators include control over 4 groups of microorganisms: - sanitary-indicative, which include: mesophilic aerobic and facultative anaerobic microorganisms (QMAFAnM) and bacteria of the group of *Escherichia coli* - BGKP (coliforms); - conditionally pathogenic microorganisms, including *E. coli*, *S. aureus*, bacteria of the *Proteus* genus, *B. cereus* and sulfite-reducing clostridia; spoilage microorganisms - mainly yeast and mold fungi; - including pathogenic microorganisms. salmonella. Regulation in terms of microbiological quality and food safety is carried out according to an alternative principle for many groups of microorganisms, i.e. the mass of the product is normalized, including bacteria of the *Escherichia coli* group, most opportunistic microorganisms, as well as pathogenic microorganisms, including salmonella. In other cases, the standard reflects the number of colony-forming units contained in 1 g (ml) of the product (CFU / g, ml). As a result of bacteriological studies, *E.coli*, *S.aureus* microorganisms, *Proteus*, *B.cereus* bacteria and sulphite-reducing clostridia, as well as salmonella were not isolated from all samples of experimental and control poultry meat. groups. Biological value and safety Biological value indicators are determined by the number of ciliates, multiplied in test samples with a certain amount of nitrogen for 4 days of cultivation. The obtained data were compared with the number of eyelashes in the control and the result was expressed as a percentage. The toxicity (harmlessness) of the studied samples was determined by the presence of dead cilia,

changes in their shape, nature of movement and inhibition of the growth of tetrachytenes. The results of the study are presented in Table 1.

Table 1
Toxicological assessment of poultry meat

Indicators	Experiment 1	Experiment 2	Management
Relative bio. value, %	100.4±1.2	100.2±1.2	100
Toxicity, % pathologist. cell shapes	0.1±0.09	0.1±0.09	0.1±0.10

The organoleptic examination of carcasses of all studied groups revealed the following indicators. In all samples, the surface of the carcass is dry, white-yellow with a pink tint; the mucous membrane of the oral cavity is shiny, light pink, slightly moistened; the beak is shiny; the eyeball is convex, the cornea is shiny; light yellow subcutaneous and visceral fat; the serous membrane of the abdominal cavity is moist, shiny; cut muscles are slightly moist, light pink in color, have an elastic structure; the smell is characteristic of fresh meat.

A cooking test in meat inspection revealed that the broth in all experimental samples was clear and fragrant. No foreign odor was detected.

As a result of bacteriological examination, no microorganisms were isolated from experimental sample meat.

Table 2
The results of physico-chemical research of meat are presented

Indicators	Management	Experimented groups		
		1	2	3
Reaction to ammonia and ammonium salts	Negative	Negative	Negative	Negative
Peroxidase reaction	Pos.	Pos.	Pos.	Pos.
RN	5.95±0.07	5.99±0.06	6.06±0.05	6.05±0.06
Relative biological value, %	100	107±1.35***	112.1±0.94***	116.5±0.58***

The table shows that the introduction of premix into the diet leads to an increase in the biological value of broiler chicken meat. Thus, the biological value increases in the groups receiving the nutritional supplement by 7–16.5% compared to the control.

Summary.

1. Blood parameters of premix broiler chickens received at a dose of 80 mg/head were within physiological limits. Also, pathological changes in the liver and kidneys were not detected when using the drug according to this scheme.
2. Premix as a sorbent for mycotoxins, heavy metals and metabolic products of bacteria and as a means of coating the mucous membrane of the gastrointestinal tract, reducing their entry into the chicken body. This leads to an increase in the productivity of broilers and an increase in the biological value of meat.
3. The data obtained on the study of the safety and productivity of broiler chickens under the influence of the premix and its effect on the quality of meat show that its optimal dose is drinking a solution of 80 mg/dose per day, head, from 5 weeks of age.

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