EFFECT OF MICRISTIMULIN USE IN POULTRY INDUSTRY

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.**Abstract.** This article presents the information about prophylaxis action of preparation Microstimulin, founded that new complex preparation has effective action against mycoplasmosis, and also can provide a high deterrent effect. The results that we obtained will be recommended for inclusion in the project how to use this preparation which file is preparing for registration.

KEY WORDS: prophylaxis, preparation, Microstimulin, poultry, infectious synovitis

Резюме. В статье приведены данные по обоснованию действия препарата «Микростимулин» на организм птицы. Доказано, что новый препарат является достаточно эффективным средством для терапии и профилактики инфекционного синовита птицы (100% сохранность). Кроме того кормовоя добавка положительно влияет на прирост массы тела бройлеров, которая за период выращивания (36 суток) на 9,3 % превышала контроль Полученные результаты вошли в листовку-вкладку препарата, досье которого готовится к регистрации в Азербайджане. Доказана целесообразность использования в системе ротации кормовой добавки «Микростимулин», разработанной на основе нанотехнологий. Установлено, что данная кормовая добавка обладает иммуномодулирующим действием.

КЛЮЧЕВЫЕ СЛОВА: профилактика, препарат, Микростимулин, птица, инфекционный синовит.

Introduction. Mycoplasmosis is a common disease in poultry. It is caused by mycoplasmas - unique organisms that are intermediate between bacteria and viruses [1, 2]. *Mycoplasma gallisepticum* and *M. Synoviae* are the most problematic species of the genus Mycoplasma in veterinary. These pathogens cause respiratory mycoplasmosis and infectious synovitis in poultry [3]. Infectious synovitis agent is the polytrophic microorganism with primary localization in the cells of the respiratory tract mucous that spreads to other organs and tissues. *M. synoviae* is excreted in the respiratory system, kidneys, liver, spleen, brain and joints. Mycoplasmas are parasites of cell membranes, they disturb the normal metabolism of cells,

prostrate their energy reserves, cause inflammatory process. In association with other infectious agents, they contribute to chronic respiratory diseases and immunosuppression. Passive effect of the latter leads to the depletion of natural resistance and cytodestructive changes of immunocompetent cells activating all bacterial and viral infections to their associate coexistence with mycoplasmas [4, 5]. *M. synoviae* has a tropism for epithelial tissues, which contributes to affect synovial membrane of joints. The main factor of the mycoplasmosis synovitis disease is an autoimmune response of the body. Thus, the infection caused by *M. synoviae* progressively influences the disruption of conjunctive tissue. Well-known researchers Landman and Febervi in their experimental studies legalized close relationship between amyloid arthropathy and *M. synoviae* infection in broilers herds [6]. The disease is accompanied by degeneration of articular cartilage and amyloid dystrophy of internals as a result of autoimmune processes. Sick or recovered poultry or their hatching eggs are sources of infection. In good conditions and feeding of poultry, mycoplasmosis is often characterized by latent course and long-term persistent effect in the body. The use of antibiotics and vaccines prevention lead to clinical wellbeing, but often it is not conducive to the full elimination of the pathogen from recovered chickens. However, under various adverse reasons, latent form of infection is able to transform into acute form of course. Irritating factors may also convert the selection and transmission of *M. synoviae.* Manifestation of the disease is caused by violation of the temperature and moist conditions, vaccination against viral infections, congestion of poultry, increased concentration of ammonia and dust in the room, unbalanced diet in essential amino acids and minerals, etc. [6, 7].

Analysis of the main researches and publications. An important factor in the epizootiology of infectious synovitis is that among strains of *M. synoviae* there appears considerable instability of virulence and tissue tropism that leads to different forms of the disease. Hereditary characteristics, age, immune status of poultry, undercurrent infections (infectious bronchitis of chickens, Newcastle disease, colibacillosis, respiratory mycoplasmosis) cause adjuvant pathogenic effect. In the world practice the best method against mycoplasmosis is obtaining and maintaining “free of Mycoplasma” status of the poultry, it means the complete elimination of infection and creating manifestation impossibility conditions. However, in practical conditions it is difficult to implement. In our country there are no special programs against poultry

mycoplasmosis in poultry-farms, they are just working out. There are regional guidelines and recommendations for the eradication of the infection. Therefore, veterinary professionals determine a strategy how to combat and prevent mycoplasmosis. Early diagnosis helps to prevent the spread of disease. However, definitive exclusion of infectious synovitis can be made just by laboratory methods. It is confirmed after the isolation and identification of pathogenic mycoplasmas species or in samples of biological material of non-vaccinated population, identified genetic material and antibodies to the causative agent. For rapid diagnosis in poultry-farm laboratories specialists apply dropping agglutination reaction. One can buy commercial antigens for the detection of antibodies in blood serum to *M. synoviae* (Intervet, Spafas etc.). In a short time one can explore the required number of blood sera samples of RA without using special expensive equipment and time-consuming methods. Confirming tests are RA, RGGA and IFA. Sensitive and highly specific polymerase chain reaction is widely used to detect the genetic material of biological objects. The main element to combat the disease is the effect on drivers of epizootic chain for breaking its parts: an adult bird → egg → chickens. It is believed that transovarian route (via hatching eggs) is the main route of mycoplasmas transmission and distribution in the farm. There is also a horizontal transmission of the pathogen. Pre-incubation processing of eggs is one of the ways against infection, which is based on breaking of the epizootic chain. There are several methods: intermittent eggs heating before incubation to 45,5 ° C; dipping them into different mycoplasmacidal solutions; injectable route of administration the antibiotics into eggs and so on. Further, chickens from disadvantaged households, from the first days of life are given antibiotics of fluoroquinolones, macrolides or tetracycline groups and probiotics [8, 9]. However, indiscriminate use of antibiotics in production, excluding all members of the association that are involved in the infectious process and the sensitivity of pathogens to drugs often do not give the desired results. But in broiler farms there is a trend to growing poultry without antibiotics. All these facts encourage researchers and practitioners to seek alternative methods of bacteriosis correction. A perspective way is the use of a variety of schemes that stimulate the immune system of poultry [10].

The purpose and objective of this research work is a development of rational schemes for poultry protection against mycoplasmas based on new drug Mikrostymulin that "Brovafarma" and "Nanomaterials

and nanotehnlogies" companies prepare for mass production. Mikrostymulin is a solution containing nanoaquachelate trace elements of cobalt, magnesium, tycoon, copper, molybdenum, zinc synthesized on the basis of modern nanotechnology.

Materials and methods. 70 Leghorn chickens were involved in the experiment. In their daily age they were divided into three groups: control (n = 30) and two experimental (n = 20). In both experimental groups two equal subgroups A and B (n = 10) and in the control group - three subgroups (A, B, and C) were additionally created. Mikrostymulin of experimental series in the rate of 1 ml per 1 liter of water was given daily for five days for daily age chickens of both subgroups of experimental group No1 through a system of watering 10-day-old chickens of both experimental groups and A and B control subgroups were infected by culture of *M. synoivae.* The culture for chickens of all A subgroups were introduced intraperitoneally and for chickens of all B subgroups - intranasally. The dose containing 500 thousand m.kl. per 1 ml according to the standard turbidity was used in both infection methods. This dose was equal to LD50, which had been titrated beforehand. During 5 days from the day of their experimental infection, Mikrostymulin was constantly added to the drinking water (1:1000) to chickens of both subgroups of experimental group No2. Follow-up of chickens of all groups were conducted during the next 10 days after infection. During that period, chickens of other subgroups did not get any chemotherapeutic agents.

Results and discussion. In the course of this experiment, it was found that the experimental drug Mikrostymulin showed pronounced prophylactic properties in experimental mycoplasmosis of poultry caused by *M. synoivae*. According to the data presented (tabl. 1), mortality of chickens from A and B control subgroups after experimental infection was very highy (90 and 100%). Thus 100% death was observed in the B subgroup in which culture mycoplasmas was introduced intranasally. The same pattern was observed in the similar subgroup of experimental group No1. Chickens of B group that prior to infection of A and B subgroups had been moved to separate isolated areas, remained healthy. Chickens of the experimental group No2, which were experimentally infected with mycoplasmosis pathogens and were given experimental Mikrostymulin solution as a prophylactic measure were reliably protected by the scheme of prevention that had been used and provided 100% survival of livestock in both subgroups

regardless of infection method. In the experimental group No 1 the experimental drug used prophylactically and the rate ended in 5 days before infection of chickens. There was 90% survival of chickens in A and B subgroups that had been infected with the same dose of the pathogen but using different ways of administration (intranasally and intraperitoneally). In A and B control subgroups there were only 10% survival of chickens infected intraperitoneally. While autopsy on the dead chickens the main changes were observed in the respiratory organs: mucous membranes were hyperemic, covered with flakes of fibrin. Nasal cavity and trachea were filled with mucous and serous, purulent and fibrinous exudates and caseous mass. Thickened walls of pneumatic bags were covered with pale yellow sticky exudate. Pleura and peritoneum were covered with fibrinous layers and films. There was detected sero-fibrinous pneumonia. The identified changes are characteristic of poultry mycoplasmosis. Thus, it was found that the new drug Mikrostymulin can provide sufficiently high therapeutic effect of infectious synovitis poultry. Its action is based on the fact that microelements form the intensity of all types of metabolism. As active centers and coenzymes they influence the activity of the majority of enzymes and hormones that regulate the body's metabolism of poultry. This activates immune-stimulating activity: rises reactivity of cellular immunity, accelerates maturation of lymphocytes, increase levels of thymine and antimicrobial activity of neutrophils, macrophages and production of antibodies. Everything happens very quickly because unlike those microelements that there are in food mostly as sulfates, Mikrostymulin active components are in the form of reckless compounds that provide high bioavailability, absorption and effectiveness.

Conclusions. 1. Experimental infection of chickens with culture of *M. synoivae* causes acute course of mycoplasmosis with high mortality, the degree of which differs slightly depending on the introduction of an infectious agent. 2. The new drug Mikrostymulin shows high therapeutic efficacy (100%) in the application during the course of the disease and considerable ability in previous corrective treatment of chickens.
3. The results will be recommended for inclusion in directions for the preparation utilization, planning to be submitted for registration.

Prospects for further researches. To conduct experiments to identify preventive action of Mikrostymulin of mycoplasmosis turkeys.

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TABLE 1

Efficiency of Mikrostymulin in experimental mycoplasmosis of chickens

Rates	Control group			Experimental group No1		Experimental group No2	
	A	B	C	A	B	A	B
The number of chickens in the subgroup	10	10	10	10	10	10	10
The number of dead chickens	9	10	0	1	1	0	0
The number of live chickens	1	0	10	9	9	10	10
Survival , %	10	0	100	90	90	100	100