

**STUDY OF THE SUSCEPTIBILITY OF *SALMONELLA ENTERITIDIS* AND *SALMONELLA TYPHIMURIUM* TO PROBIOTICS AND ANTIBIOTICS**

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**Abstract.** This article presents the results of a study of the antibiotic and probiotic susceptibility of *Salmonella enteritidis* and *Salmonella typhimurium*, the causative agents of salmonellosis in chickens. As a result of laboratory studies, the causative agents of poultry salmonellosis were found to be *Salmonella enteritidis* and *Salmonella typhimurium* are sensitive to antibiotics such as *Ciprox*, *Baytril*, *Levomycetin* and also showed high sensitivity to the probiotic 'Innoprovect', which can be further used for the treatment of poultry salmonellosis caused by *Salmonella enteritidis* and *Salmonella typhimurium*.

**Key words:** poultry farming, salmonellosis, infection, *Salmonella enteritidis*, *Salmonella typhimurium*, antibiotics, probiotics.

**Introduction.**

**Poultry Salmonellosis** – is an infectious bacterial disease of many species of domestic and wild birds, characterised by septicaemia and damage to the respiratory and digestive organs in chicks and chronic or latent damage to the reproductive organs in adults. This disease has both epizootological and epidemiological significance.

Poultry contaminated with salmonella is a source of infection for humans, and poultry products - meat and eggs - cause food poisoning.

According to the WOA, salmonellosis is a more complex disease due to issues of acceptance and loss. The main reason for these complications is the large number of pathogens - there are 2300 serovars - and birds can carry the pathogen without showing clinical signs.

At the same time, *Salmonella* is a permanent intestinal microflora, gets on the surface of eggs or meat when they are slaughtered, and in case of improper storage or poor quality processing causes severe mass poisoning in people.

The main tactic to ensure the safety of poultry products is to protect against salmonellosis. At the same time, keeping poultry free of this disease ensures the quality and safety of meat and eggs from poultry farms.

According to some scientists, one of the most effective means of preventing salmonellosis are special vaccines (Lesnichenko I.Yu. 2011). Today, some of the new modern vaccines are 'SalmAbic', 'Avivac-Salmovac', 'Gallimune SE' (prepared from *Salmonella enteritidis* antigen), 'Gallimune SE-ST' (prepared from *Salmonella enteritidis* and *Salmonella typhimurium* antigens).

The advantages of inactivated vaccines include their environmental safety and their ability to be used in combination with antibiotics and probiotics.

However, in chicks from immunised laying hens, immunity against *Salmonella enteritidis* persists only for 6-10 days (Smirnov D., Rozhdestvenskaya T., Kononenko E., Svetoch E., 2011).

The use of antibiotics in the treatment of salmonellosis does not allow the complete elimination of salmonella [1,2], which leads to a reduction in the quality of poultry products, the residual amount of antibiotics prevents the products from entering the world market, and the constant use of antibiotics damages the bioecology of the environment, causing the emergence of antibiotic-resistant bacterial strains. This situation has arisen primarily as a result of the violation of existing principles of antibiotic use. [4]

Currently, several antibiotic preparations have been developed and are widely used in human and veterinary medicine [2]. However, there is a decline in the body's immunological reactivity, increasing resistance of existing drugs to pathogenic microbes in the body, improvement of existing drugs and the search for new means of treating infectious diseases.[3]

According to clinical evidence, probiotics in infectious diseases may contribute to the healing process by modulating the immune response and limiting pathogen colonisation. [5,6,7,8]

The aim of our research was to study antibiotic and probiotic resistance of poultry salmonellosis pathogens.

#### **Materials and methods of research.**

*Salmonella enteritidis* and *Salmonella typhimurium* previously isolated from farms in Samarkand region (farms 'Malakhit Parranda', 'Chupon-ata Parranda', 'Afrosiyob Parranda').

The studies were conducted at the State Centre for Animal Disease Diagnostics and Food Safety of Samarkand Region.

To study the resistance of pathogens of chicken salmonellosis, *Salmonella* cultures were sown in Petri dishes. After 10 minutes, 0.1 ml of Innoprovect solution containing  $0.1 \times 10^9$  microbial bodies per ml was dropped onto the surface of the first Petri dish with *Salmonella enteritidis*, discs with impregnated antibiotics were placed on the surface of the second Petri dish with *Salmonella enteritidis* at equal distance from each other, 0.1 ml of 'Innoprovect' was placed in the third Petri dish with the seeded *Salmonella typhimurium* culture, and discs with antibiotics were placed on the fourth Petri dish.

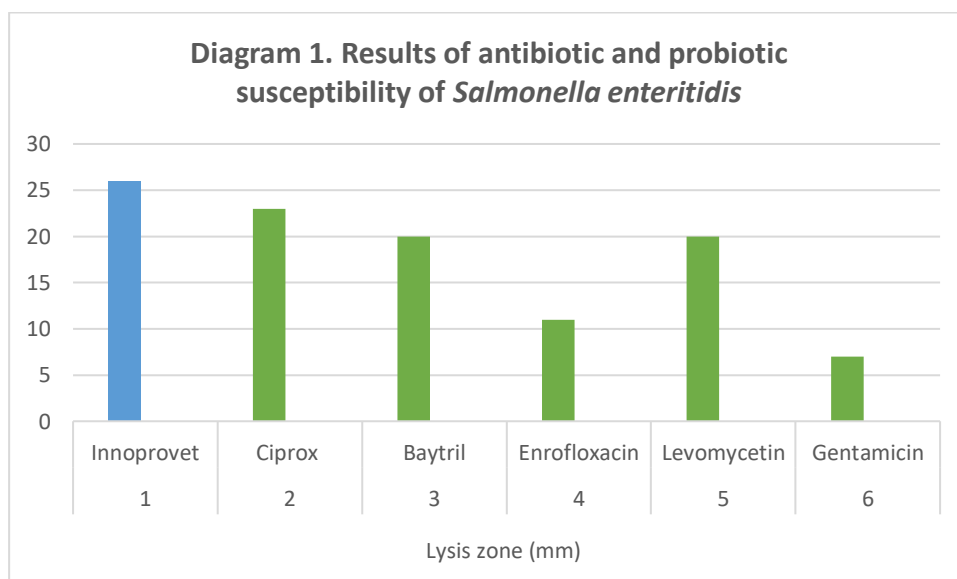
The cultures were placed in a thermostat at 37°C. The results of the study were evaluated by the absence of growth of salmonellosis cultures in Petri dishes.

#### Study results.

A.Sh.Alimardonov and N.V.Semenova (2012) reported that *Salmonella* isolated in Uzbekistan were very sensitive to preparations such as Colmik E, Enroflox, Quinocol, Baytril, Renrovect, Vilflox and Ciprox.

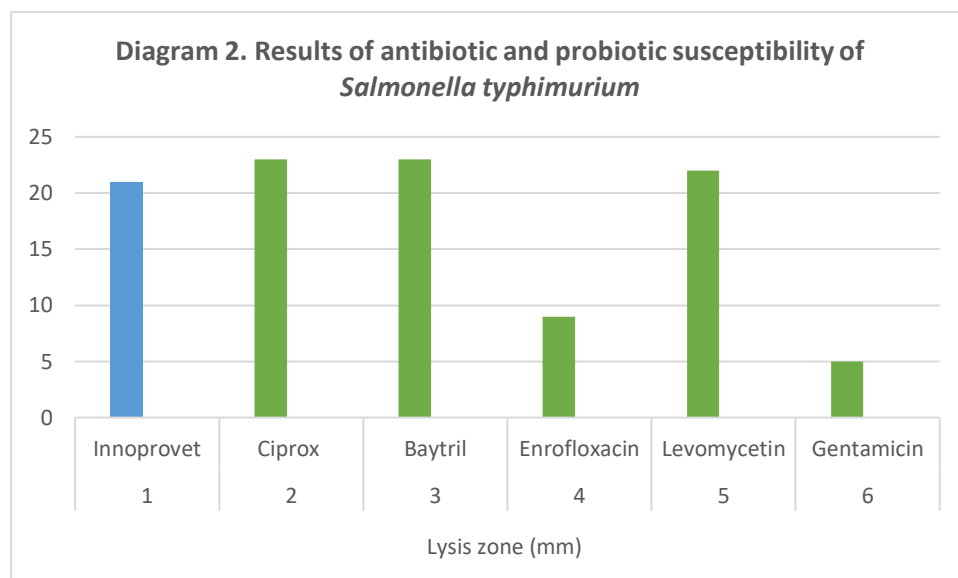
In our study, we selected Ciprox, Baytril, Enrofloxacin, Levomycetin and Gentamicin from these preparations.

The results of antibiotic and probiotic susceptibility of *Salmonella enteritidis* are presented in Diagram 1.



As can be seen from the data presented, *Salmonella enteritidis* showed the highest sensitivity to the probiotic preparation 'Innoprovit' (diameter of the lysis zone - 26 mm) and high sensitivity to antibiotics: Ciprox (23 mm), Baytril (20 mm), Levomycetin (20 mm), while the activity of such antibiotics as enrofloxacin and gentamicin was low (11 and 7 mm).

The results of antibiotic and probiotic susceptibility of *Salmonella typhimurium* are presented in Diagram 2.



A slightly different sensitivity of the salmonellosis culture of the genus *Salmonella typhimurium* is indicated by the results presented in Diagram 2. The probiotic sensitivity and antibiotic sensitivity of this culture were almost equal (21; 23; 23; 23; 22 mm). Antibiotics of the genus Enrofloxacin and Gentamicin showed the same low efficacy against *Salmonella typhimurium* as against *Salmonella enteritidis* (9;5).

### Conclusion.

On the basis of the results of the laboratory tests, the following conclusions can be drawn:

1. The sensitivity of the pathogens *Salmonella enteritidis* and *Salmonella typhimurium* to the antibiotics Ciprox, Baytril, Levomycetin and the probiotic 'Innoprovit' was determined.
2. The probiotic 'Innoprovit' has been demonstrated to exhibit a markedly heightened sensitivity against *Salmonella enteritidis*, the agent of poultry salmonellosis, in comparison to antibiotics.

3. The sensitivity of probiotic 'Innoprovect' to *Salmonella typhimurium*, the causative agent of poultry salmonellosis, was found to be slightly lower than that of antibiotics Ciprox and Baytril.

4. In veterinary practice, the use of the probiotic 'Innoprovect' is recommended for the treatment of salmonellosis in poultry caused by *Salmonella enteritidis* and *Salmonella typhimurium*.

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