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Creation of a Veterinary Drug Based on the Bacteriophages

Abstract: The Russian Federation accounts for more than 5% of global poultry meat production, which amounts to more than 4.7 million tons per year. Poultry meat is the main source of animal protein for the population of Russia; its consumption grows annually, and has reached 34 kg per capita per year in 2020. Egg production in the Russian Federation in 2021 amounted to 44.9 billion eggs, and consumption – 308 eggs per capita per year. At the same time, salmonellosis remains one of the main problems of poultry farming in the world. The World Health Organization (WHO) Global Foodborne Infections Monitoring showed that 47% of all outbreaks were caused by *Salmonella*, 34% of which were associated with the consumption of chicken meat, and the annual damage due to salmonellosis in the world, according to the Russian State Center for Quality and Standardization of Veterinary Drugs and Feed (VGNKI), is estimated at \$1-3 billion. Currently, in veterinary medicine there is no a universal salmonellosis treatment and prophylaxis protocol. This is partly due to the wide variety of nosological forms of this infection. Antibiotic therapy widely used at poultry farms both for treatment and recuperation does not ensure efficient elimination, prevention of infection or combating the bacilli carriage, and the residual amounts of antibacterial chemotherapeutic drugs negatively affect the quality of products and are the controllable indicators. The random pattern use of antibiotics in agriculture is a major contributing factor to the spread of antibiotic resistance, which was recognized by the UN General Assembly in 2016 as a global threat to humanity. Member countries of the World Trade Organization have made commitments to limit the use of antibiotics in industrial poultry farming to improve product safety. The disadvantages and restrains associated with the use of antibiotics make the alternative methods of combating the salmonellosis increasingly relevant: the use of hyperimmune and anti-toxic sera, probiotics and bacteriophages. The most promising alternative drugs are bacteriophages. The report presents the results of the research aimed at finding the *Salmonella* bacteriophages from *Salmonella* strains isolated from the birds and environmental objects; creating a collection of bacteriophages of the genus *Salmonella* with the most expressed lytic activity; studying the morphological characteristics of the isolated bacteriophages using the transmission electron microscopy; determining the spectrum of their lytic activity against various strains of *Salmonella* to enable creation of a native veterinary drug based on the bacteriophages for treatment and prevention of salmonellosis in birds.