

EPISOTOTIC SITUATION AND AETIOLOGICAL STRUCTURE OF POULTRY SALMONELLOSIS IN KHMELNYTSKYI REGION

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The article presents the research findings of the epizootic situation and etiologial structure of the causative agents of poultry salmonellosis in Khmelnytskyi region for the years 2014-2022. As a result of the analysis, it was established that three types of pathogens of poultry salmonellosis circulate in Khmelnytskyi region: Salmonella enteritidis, S.gallinarum-pullorum and S.typhimurium. The predominant serotype was Salmonella enteritidis (64 cases). During this period, the largest number of poultry salmonellosis cases in various types of researched material (was recorded in Kamianets-Podilskyi district (69). It was established that the researched material in which salmonellosis pathogens were most often detected were poultry carcasses and their droppings, fewer pathogens of salmonellosis were detected in flushes from equipment, bedding from transport boxes, eggs, etc.

Key words: *poultry salmonellosis, epizootic situation, etiologial structure, serotype, Salmonella*

Formulation of the problem. The main place in the etiologial structure of infectious diseases of poultry is occupied by microorganisms of the intestinal group, mainly represented by escherichia and salmonella in association with other types of opportunistic bacteria [1]. Poultry salmonellosis is an infectious bacterial disease that poses one of the most urgent problems of modern poultry farming in all countries of the world. Salmonellosis is characterized by an acute course in the form of septicemia in young birds and a latent infection in adult birds. Economic losses due to salmonellosis of chickens consist mostly in losses from the death of young chickens, retardation of their growth and development, reduction of egg and meat productivity of adult livestock, culling of sick and salmonella carriers, restrictions on the sale of products from farms affected by chicken salmonellosis, expenses for the improvement of farms. In food products that are not subjected to heat treatment, salmonella can multiply to such an extent that it causes gastrointestinal diseases and intoxication in people who use these products. A sick bird secretes the pathogen, infects equipment, water, and feed. Contaminated feed, water, equipment and bird care items, and soil are the main factors of transmission of the pathogen. In addition, such weakened chickens are more exposed to other pathogenic agents. [2-4]. Despite numerous studies of domestic and foreign researchers on issues of epizootological features and preventive measures [5-9], the problem of poultry salmonellosis remains quite relevant in today's conditions.

Analysis of recent research and publications. Poultry salmonellosis is caused by more than 200 serotypes of microorganisms [10]. Most scientists believe that the main efforts to prevent salmonellosis should be directed to those serovars that pose the greatest danger to poultry and humans. These serovars for Europe are S. typhimurium and S. enteritidis, which have a wide range of susceptible organisms. S. enterica serovars such as S. typhi, S. dublin and S. gallinarum have a limited range where they are associated with one or more animal species [11]. In the spectrum of isolated Salmonella, serological variants are dominant in the territory of Ukraine include: S. typhimurium, S. Gallinarum - pullorum, S. Enteritidis and others [12]. As for the microbiological monitoring of a number of poultry farms in Ukraine, the causative agents of salmonellosis are widespread on its territory. During serotyping, salmonella was assigned to 10 serovars: S. enteritidis – 46.9%, S. typhimurium – 14.1%, S. pullorum – 10.1%, S. gallinarum – 10.0%, S. virchow – 6.3%, S. infantis – 2.1%, S. arizona – 1.2%, S. jawa – 0.6%, S. montevideo – 0.4%, S. copenhagen – 0.4% [13].

According to an epizootological analysis of the spread of poultry salmonellosis in Ukraine for 2012–2021 [14], the number of positive samples was 0.3% of the total number of samples (306,466 samples). Significant unevenness was observed in the number of samples tested for salmonellosis. Thus, in 2012, 51,985 samples were examined, but in 2020, only 25,796 samples came under observation, or 49.6% of the peak indicator. According to the authors, the epizootic situation regarding poultry salmonellosis in poultry farms of different forms of ownership in different regions of Ukraine

is heterogeneous and has its own characteristics. The largest number of positive samples during the research of biological and pathological material regarding poultry salmonellosis was found in Sumy (156) and Luhansk (186) regions. In Khmelnytskyi region, according to the data obtained by the authors, the number of detected positive samples was insignificant. As for the study of the etiological structure of poultry salmonellosis in Khmelnytsky region, similar studies have not been conducted.

The aim of the work was to study the epizootic situation and etiological structure of poultry salmonellosis in the Khmelnytsky region for the years 2014-2022 (first half of the year).

Research materials and methods. In the paper, the data of the examinations of the Khmelnytskyi Regional State Laboratory of Veterinary Medicine were used and processed. Isolation of salmonellosis pathogens was carried out by bacteriological, microscopic and serological methods. Of the serological research methods, the agglutination reaction was used.

Research results and their discussion As a result of the conducted analysis, it was established that three types of pathogens of poultry salmonellosis circulate in Khmelnytskyi region, namely: *Salmonella enteritidis*, *S.gallinarum-pullorum* and *S.typhimurium* (Table 1). *Salmonella enteritidis* serotype was dominant (63 cases), *S.gallinarum-pullorum* serotype was detected in a smaller number of cases (29), and *S.typhimurium* serotype was registered in the smallest number of cases (4) (Table 1).

Table 1. Results of laboratory studies on poultry salmonellosis in the Khmelnytskyi Region for 2014-2022 (first half of the year)

Name of district	Researched material	Amount of researched material	Serotypes of the pathogen
Kamianets-Podilskyi District	Chicken carcasses	20	<i>S.enteritidis</i>
	Flushes from equipment	5	<i>S.gallinarum-pullorum</i>
		10	<i>S.enteritidis</i>
	Litter from boxes for transportation	1	<i>S.gallinarum-pullorum</i>
		4	<i>S.enteritidis</i>
	Droppings	4	<i>S.gallinarum-pullorum</i>
20		<i>S.enteritidis</i>	
	1	<i>S.typhimurium</i>	
	Eggs	4	<i>S.enteritidis</i>
Total		69	
Horodotskyi District	Droppings	3	<i>S.enteritidis</i>
Total		3	
Chenerovetskyi District	Chicken carcasses	10	<i>S.gallinarum-pullorum</i>
Total		10	
Dunaievetskyi District	1-day-old chicks	2	<i>S.gallinarum-pullorum</i>
	Frozen embryos of chickens	4	<i>S.gallinarum-pullorum</i>
Total		6	
Khmelnytskyi District	Chicken carcasses	1	<i>S.gallinarum-pullorum</i>
	Eggs	6	<i>S.gallinarum-pullorum</i>
	Litter from boxes for transportation	1	<i>S.enteritidis</i>
Total		8	
Voločyskyi District	Droppings	3	<i>S.typhimurium</i>
	Litter from boxes for transportation	2	<i>S.enteritidis</i>
Total		5	

If we analyze the situation by district, we can conclude that the largest number of salmonellosis cases found in various types of researched material was recorded in Kamianets-Podilskyi district (69). Moreover, among the three serotypes of salmonellosis causative agents, *S. enteritidis* was found the most (58). Speaking of the the studied material, most cases of salmonellosis were found in poultry droppings, including all three types of salmonella. Two serotypes of the pathogen (*S.gallinarum-pullorum* and *S.enteritidis*) were detected in flushes from equipment and bedding from transport boxes. One serotype (*S. enteritidis*) was found in chicken carcasses and in eggs.

Significantly fewer cases of salmonellosis (10) were registered in Chemerovetskyi district, in chicken carcasses only and including one serotype (*S.gallinarum-pullorum*). In Khmelnytskyi district, 8 cases of poultry salmonellosis were recorded by detecting pathogens in chicken carcasses, eggs and litter from transport boxes. The dominant serotype was *S.gallinarum-pullorum*. Also, 6 cases of poultry salmonellosis were registered in Dunaievetskyi district, 1-day-old chicks and frozen embryos were used as research material. *S.gallinarum-pullorum* serotype was also dominant here. Finally, the smallest number of cases was detected in Volochyskyi district in droppings (*S.typhimurium*) and litter from transport boxes (*S.enteritidis*).

Thus, the conducted research on the distribution and etiological structure of animal leptospirosis made it possible to find out the general picture of the pathogen spectrum and establish the main strains of salmonella that cause the disease in poultry, which, in turn, will facilitate planning measures to prevent salmonellosis of poultry in Khmelnytskyi region much more effectively.

Conclusions. *S.enteritidis* serotype turned out to be the dominant pathogen of poultry salmonellosis in Khmelnytskyi region. The researched material in which the causative agents of salmonellosis were most often detected were poultry carcasses and chicken droppings.

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ЕПІЗООТИЧНА СИТУАЦІЯ ТА ЕТІОЛОГІЧНА СТРУКТУРА САЛЬМОНЕЛЬОЗУ ПТИЦІ В ХМЕЛЬНИЦЬКІЙ ОБЛАСТІ

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*В статті наведено результати досліджень щодо вивчення епізоотичної ситуації та етіологічної структури збудників сальмонельозу птиці в Хмельницькій області за 2014-2022 роки. В результаті проведеного аналізу встановлено, що в Хмельницькій області циркулює три види збудників сальмонельозу птиці: *Salmonella enteritidis*, *S.gallinarum-pullorum* і *S.typhimurium*. Домінуючим виявився серотип *Salmonella enteritidis* (64 випадки). Протягом даного періоду найбільшу кількість випадків сальмонельозу птиці в різних видах досліджуваного матеріалу було зафіксовано в Кам'янець-Подільському районі (69). Встановлено, що досліджуваним матеріалом, в якому найчастіше виявляли збудників сальмонельозу, були трупи птиці та їхній послід, менше було виявлено збудників сальмонельозу в змивах з обладнання, підстилки з ящиків для транспортування, яйцях тощо.*

Ключові слова: сальмонельоз птиці, епізоотична ситуація, етіологічна структура, серотип, *Salmonella*.